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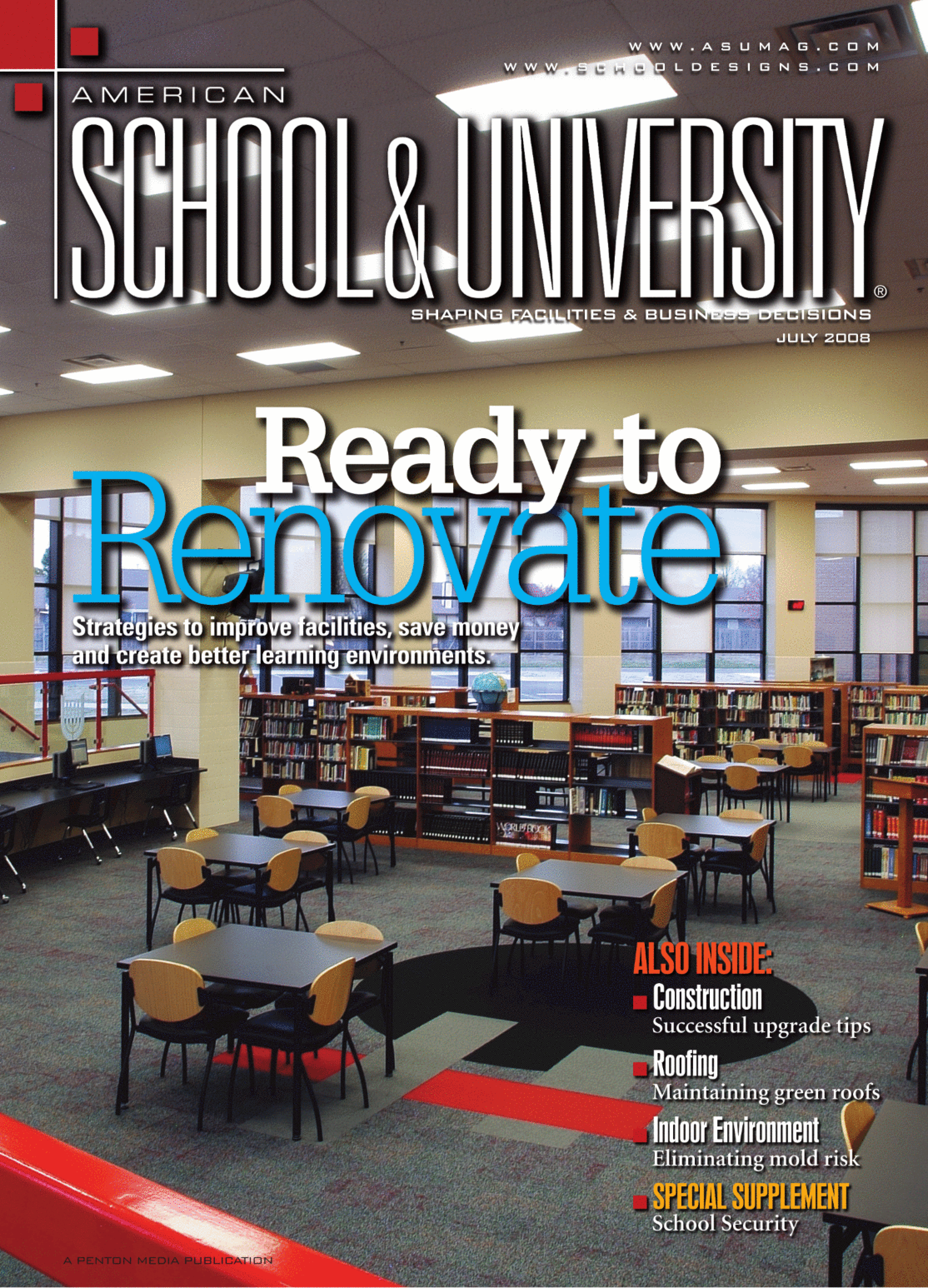

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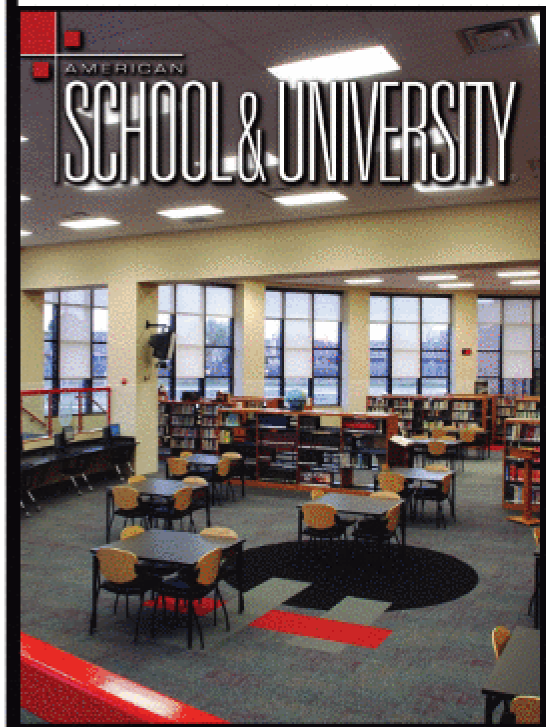

On the Cover: Union 8th Grade Center, Tulsa, Okla.; Architect: Crafton Tull Sparks; Photographer: Jon B. Petersen

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Green Initiative

The on-again, off-again courtship with federal education-infrastructure funding is on again.

Last month, the House passed the 21st Century Green High-Performing Public School Facilities Act, which commits more than $20 billion over the next five years to assist states in the building and renovation of schools. Proponents say the initiative, designed to make schools more energy-efficient and environmentally friendly, could save institutions billions of dollars in energy costs and make facilities more healthful for building occupants.

While the Senate still must consider the initiative, the White House already has threatened a veto.

Education as a whole does not seem to be at the top of many politicians' agendas these days, which is discouraging to say the least—especially in a Presidential-election year, where education typically takes a more prominent role. The economy, geopolitical crises, healthcare and other issues continue to take center stage and overshadow education initiatives.

The school facilities act, if enacted, would provide funding starting in the 2009 budget year. Requirements for meeting the green standards would be phased in, and projects would have to meet either Leadership in Energy and Environmental Design (LEED), Collaborative For High Performance Schools or Energy Star standards.

While ultimate passage is a long shot in the current political climate, the initiative does tap in to the growing interest and acceptance of all things green, sustainable and energy-efficient. Especially as costs for construction, materials, energy, etc., continue to skyrocket, tying funding to life-cycle costing that such an initiative encourages ensures appropriate amounts are spent upfront to capture long-term savings, as well as other learning, health and environmental benefits.

Many schools and universities already have embraced the green movement. If you are looking to improve your institution's commitment to green, attend this summer's free Green Cleaning webinar series (visit ASUmag.com and click on the link at the top right to register). ■

Joe Agron

jagron@asumag.com

WEB 101

Hot topics

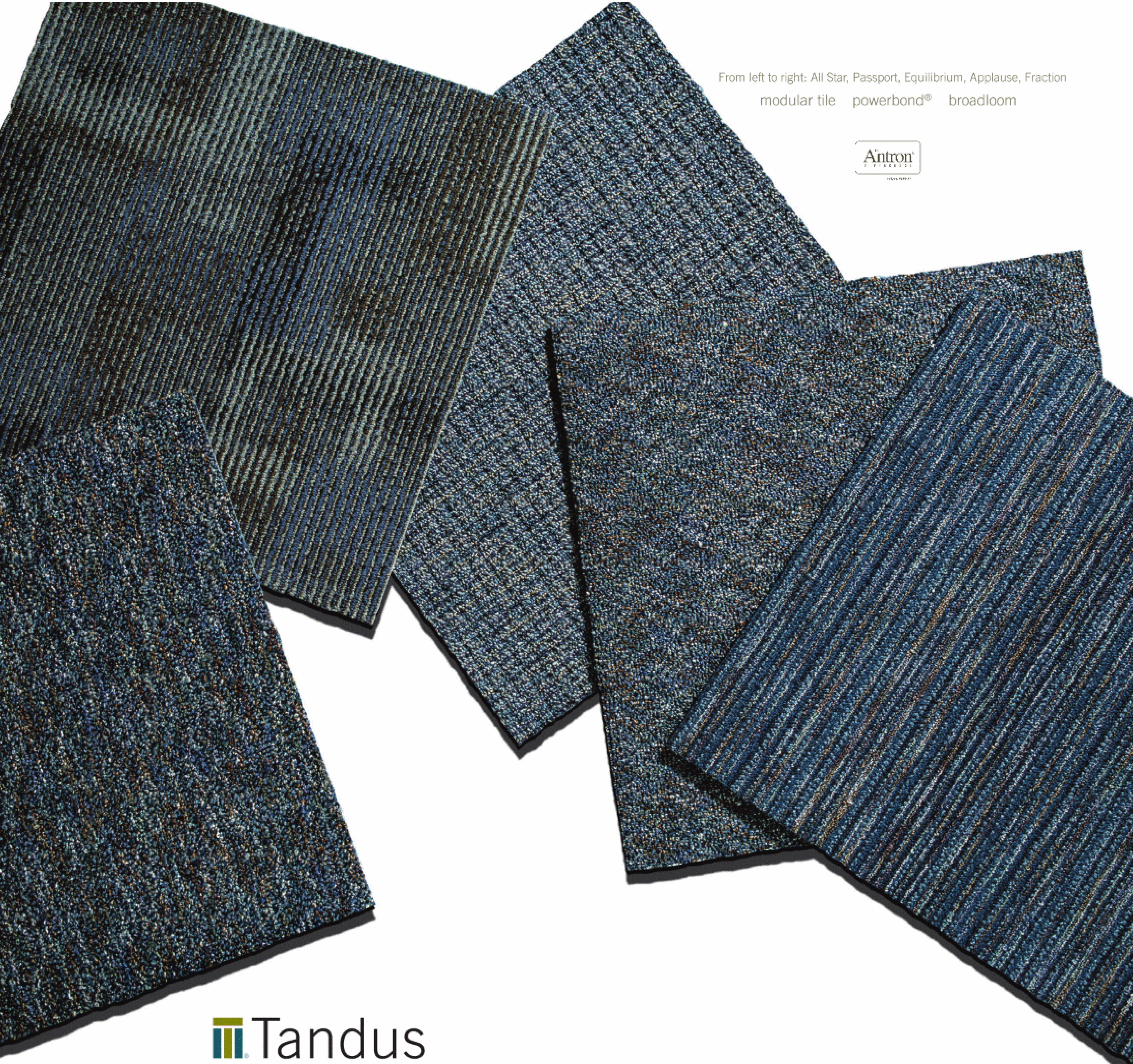
Concerned about underage drinking, administrators at the University of Scranton, Pa., are trying to block a local pizzeria from opening a dance club and bar in its basement. A question posed recently on Schoolhouse Beat—The Blog asked whether a university should be able to prevent bars and dance clubs from opening too close to campus. Some of your feedback:

- "Yes. Universities have the right and duty to guard the physical, mental and spiritual well-being of their student enrollment and this doesn't include a bar and dance hall across the street."

And from the other side ...

- "I don't think that kids who want to drink would be deterred if they had to walk a block or two more or less to do so."

What are your hot topics? Visit our blog via our homepage at asumag.com or directly at http://blog.asumag.com/schoolhouse_beat and let us know what you think about what others are saying. *—Susan Lustig*



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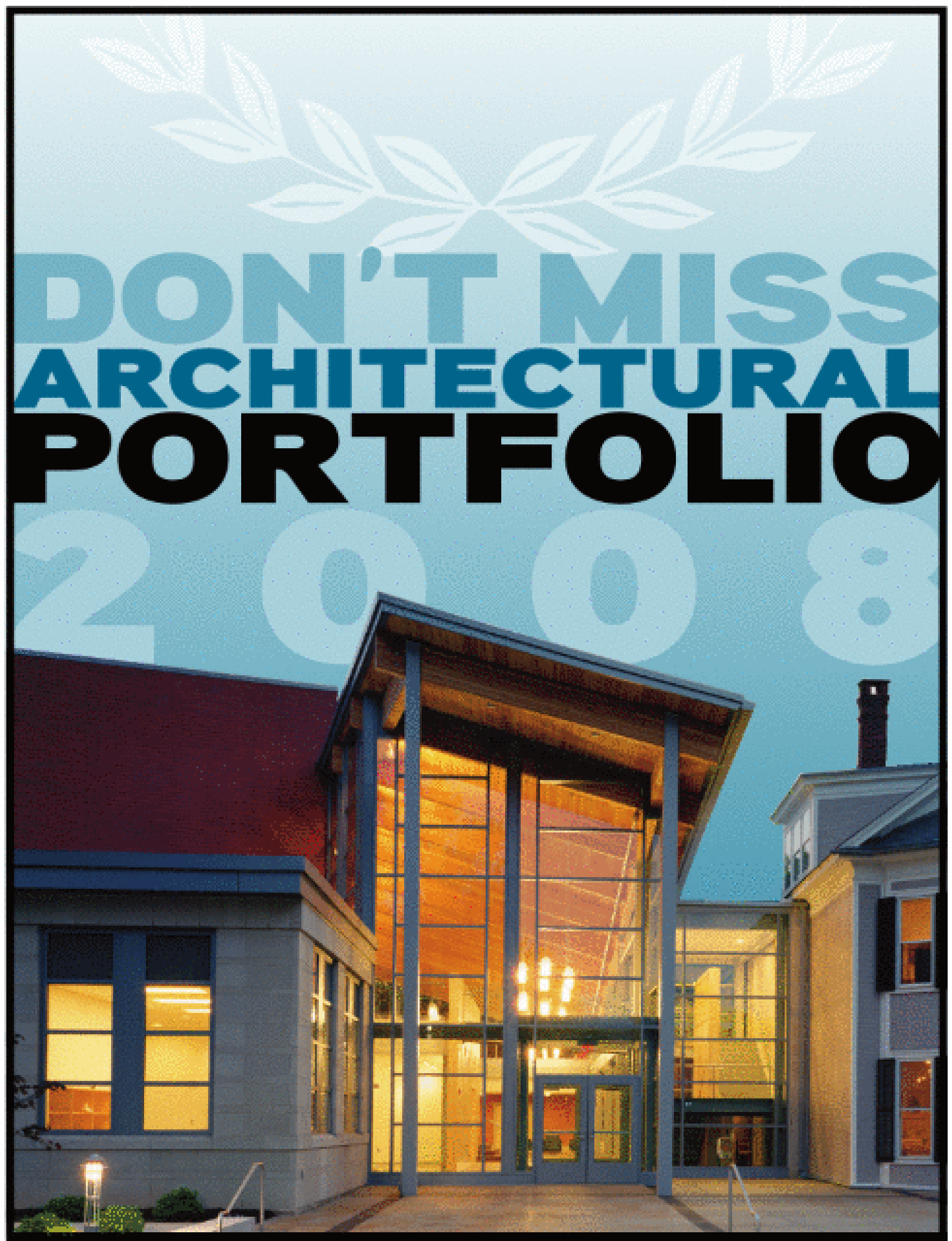

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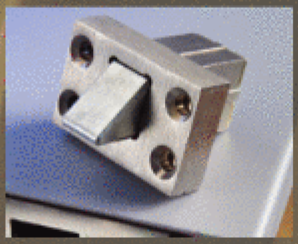

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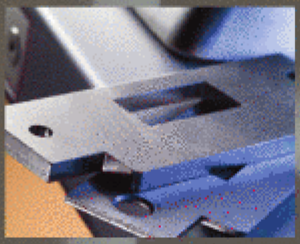

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CONSTRUCTION ZONE
UPGRADES/RETROFITS

Hands-on learning

A multi-phased renovation is underway at Lewis & Clark Career Center, St. Charles, Mo., as part of a long-term master plan that was formulated in 2003 to unify the four buildings on the 40-year-old campus.

Phase I redevelopment, completed in December 2005, included a new HVAC system and electrical system upgrades.

Recently completed phase II renovations feature an 1,887-square-foot space that replicates a supermarket with two checkout lanes, a loading dock, walk-in cooler and several shelving units. Phase II also improved lighting and ventilation in the welding classroom; added classrooms for automotive repair; expanded the automotive collision facility; added new restrooms; and relocated all classrooms to the main level. Outside, buildings were connected so students no longer are exposed to the elements during class changes.

Phase III will resurface parking lots and improve adjoining access roads.

The architect is Wm. B. Ittner, Inc. (St. Louis). Morrissey Construction (Godfrey, Ill.) is the general contractor.

Lewis & Clark Career Center, St. Charles, Mo. Photo courtesy of Wm. B. Ittner, Inc.

Trinity College Long Walk, Jarvis Hall, Hartford, Conn. Photo courtesy of Consigli Construction Co., Inc.

Gothic architecture restored

Trinity College Long Walk, Hartford, Conn., is a collection of historic buildings constructed in the 1800s. Jarvis and Seabury Halls, completed in 1878, and Northam Hall, completed in 1883, stand out as hallmarks of the master plan of English architect William Burges. After workers discovered that slate roofs and stonework surrounding the dormer windows needed substantial repair, the college decided on a complete restoration.

The project includes renovations and upgrades to residence hall rooms, classrooms and administrative spaces, and gut renovations to the buildings' interiors. Both buildings will be equipped with new wiring, lighting, plumbing and air conditioning, as well as new furnishings. Residence hall rooms in Jarvis Hall will be returned to their original suite-style configuration. The architect will make use of the original building plans that were discovered in the school's archives.

The buildings feature a cast-iron window design, which was popular in mid-18th-century England. The construction manager traveled to Talladega, Ala., to meet one of two known artisans capable of restoring the design. The project manager traveled to the English countryside to meet with one of the few establishments capable of replicating the original terra-cotta ridge caps lining the roof's edge.

The architect is Smith Edwards Architects (Hartford, Conn.). Consigli Construction Co., Inc., (Enfield, Conn.) is the construction manger.

Start: Summer 2007
Estimated completion: August 2008
Project area: 44,000 sq. ft. of renovations to three buildings
Cost: $32.9 million

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Expansion blends with campus

The University of Colorado, Boulder, recently added 65,000 square feet and renovated 100,000 square feet of space in the Koelbel Building at the Leeds School of Business. The project totaled $38 million.

The expansion serves as the new public entrance to the building and features many classical elements such as a domed cupola and a colonnaded entry porch. The design was planned carefully to blend into the campus' Tuscan Vernacular style, which features rough-hewn stone exterior walls, limestone, trim accents and Mission-style, multi-hued tile roofs.

University of Colorado, Leeds School of Business, Koelbel Building, Denver. Photo courtesy of Casey Cass

The university added new classrooms outfitted with the latest technology, team study rooms, a business conference center, new offices for business research, program administration offices, expanded common spaces and a two-story library with an information commons—a coffeehouse-style space with lounge furniture, computers, e-mail stations and a coffee bar.

The project is pursuing LEED gold certification.

The architect of record is Davis Partnership Architects (Denver). The design architect is ARC/Architectural Resources Cambridge (Cambridge, Mass.).

Episcopal High School, Centennial Gymnasium rendering, Alexandria, Va.

Gymnasium addition

Episcopal High School, a 435-student boarding school set on 130 acres in Alexandria, Va., has planned a 60,000-square-foot gymnasium addition that will triple the size of its existing facility. It is scheduled to be completed by August 2009.

The gymnasium opened in 1939 and is one of several traditional brick structures within the scenic campus. The addition will include a new auxiliary gymnasium with two courts, a fitness center, team-meeting room, boys' and girls' locker rooms and a hall of fame area with a display space. The school also will renovate 20,000 square feet of the ground level of the existing gymnasium, including the visitors' locker room area, training spaces and equipment storage.

The architect is Cannon Design (Arlington, Va.).

Cafeteria renovation

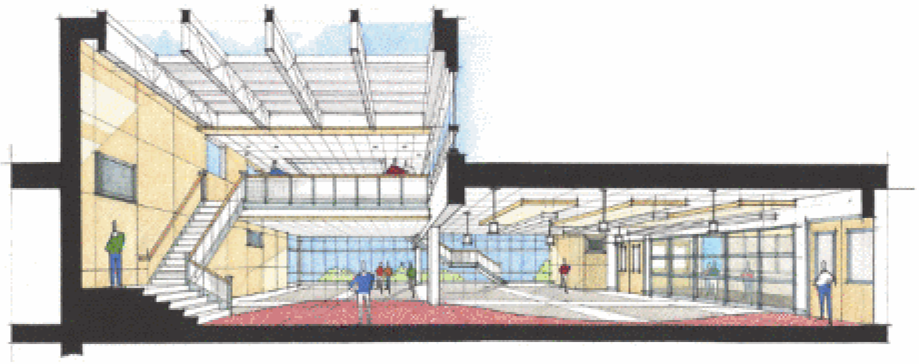
Bergen Academies, Hackensack, N.J., will expand its existing dining area by an additional 4,493 square feet. The renovated cafeteria will serve about 1,000 students.

The renovation and expansion totals 11,800 square feet. The addition includes a mezzanine floor, which will be used as a senior lounge, a two-story atrium space and a complete upgrade of the food-preparation and serving areas.

The institution wanted the dining space to be architecturally expressive. As a result, the design allows for natural lighting, maple wood, exposed steel and cool graphics for the menus. Neutral colors were chosen, and the beams and columns were left visible to give the room a more youthful, collegiate and timeless feel.

The food court will include at least five food-preparatory stations including a coffee bar, hamburger station, pizza stand and salad bar.

The architect is DMR Architects (Hasbrouck Heights, N.J.). ■



Bergen Academies rendering, Hackensack, N.J.

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Administrators have many things to consider when planning construction and renovation projects on campus.

Ready to Renovate

Schools and universities should have a thorough plan that sets priorities for the most pressing facility renovations.

By Mike Kennedy

With remedial programs, enrichment offerings, recreational activities and extended-year schedules, many school facilities are no longer dormant in the summer months. On college campuses, the summertime pace might be more leisurely, but plenty of students and staff fill the same roles they have the rest of the academic year.

The increased year-round use of education facilities benefits students and enables schools and universities to use their buildings more efficiently, but it has made it more difficult for workers to carry out needed renovation and maintenance projects on a campus. A school that

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is unable to fit a renovation project into a summer recess may have to find temporary space to house a program while work is being completed; if a school needs to continue using part of a facility while work is taking place, administrators need to take steps to ensure that the appropriate safety precautions are in place to protect students and staff members whose classes or jobs take them in or near a construction zone.

The shrinking summer construction season on school and university campuses is one reason that administrators must plan their renovation projects carefully. In addition, a comprehensive renovation plan will help schools identify their most pressing needs, establish timelines for carrying them out, and ensure that the projects stay within the available budget.

Before administrators can determine where their renovation and maintenance gaps are, they must have a clear understanding of what they have on their campuses.

Campus inventory

Before administrators can determine where their renovation and maintenance gaps are, they must have a clear understanding of what they have on their campuses. This is especially important information on campuses that have a significant backlog of maintenance and renovation needs, says Michael Gautney, director of facilities, administration and planning at the University of North Alabama in Florence.

"What any facilities manager needs to do," says Gautney, "is first get a list of everything you have on your campus—all the buildings, what their age is, how old the furniture is; how old the equipment is; how long since you have painted; how long since you have replaced the carpet. Then you determine the work that needs to be done and assign a dollar value to all of it."

A comprehensive list of needs enables facility managers to decide more objectively which renovation projects to pursue, Gautney says. Without data to reinforce their decisions, administrators might acquiesce to the demands of the squeakiest wheels or those with the most clout on campus.

"Now we have a database that can project 10 years out, factor in inflation, and tell us what the cost will be if we wait 10 years," says Gautney. "We can have a forecast of what we'd like to accomplish."

One of the major renovation projects in 2007 was a $1.3 million overhaul of Rogers Alumni House. Replacing the facility was not an option—the mansion was built in 1855 and is on the National Register of Historic Places. It was donated to the university in 1948. Gautney says that because of the designation, the university had to be meticulous about carrying out the renovation and the types of material used. The building now has new steel skeletal structuring, new floor joists and a new air-circulation system. It houses offices for the university's foundation, alumni relations, publications and university relations staff. The main floor is designed to accommodate receptions and entertaining.

The university spent $2 million last year on renovations and has allocated $3 million this year, says Gautney.

If a school or university can create a work zone that does not lead to safety problems for students or other employees, a renovation project can take place while parts of a facility remain in use. In other cases, the work is too disruptive or dangerous and would not be safe for those not involved in the actual renovation, so schools have to temporarily shut down space and relocate campus functions.

"We have done both," says Gautney.

At Willingham Hall, a building constructed in 1939, the renovations required were extensive enough that relocation was the best option. The $1.4 million renovation is nearly completed. The facility, which houses the English, history and political science departments, initially had been a residence hall.

"We have moved everybody completely out," says Gautney. "We are installing a new central heating and cooling system, replacing single-pane windows with double panes, doing a lot of re-painting and installing new carpets."

The university also gutted basement space that had been unused since the 1950s and created 16 additional faculty offices, says Gautney.

This summer, North Alabama also is replacing the grass on an athletic practice field with artificial turf, and upgrading one of its residence halls.

"We try to plan around the summer the best we can," says Gautney. "But some of our projects are 12 months or longer, so it's not always possible."

What comes first

Except for the rare education institution that has sufficient resources to meet all its facility needs, administrators will have to make hard choices about which renovation projects get done now and which ones

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> In developing a plan to address renovation and maintenance needs, schools and universities must decide which work is most critical.

have to go on the back burner. In developing a plan to address renovation and maintenance needs, schools and universities must decide which work is most critical.

In 2007, the Palo Alto (Calif.) Unified District put together a facility master plan that spelled out eight priorities for determining the importance of needed improvements. (Its previous master plan was completed in the 1990s and reconfigured in 2000.)

The new master plan establishes the top priority as health and life safety; the other priorities, in order of importance, are compliance with the Americans with Disabilities Act; building-shell integrity; classroom interior upgrades and infrastructure; program support upgrades and infrastructure; athletic facilities; site development and landscaping; and expansion of facilities.

The 350-page plan used the eight priorities as a basis for spelling out in detail the scope of renovations needed in the 10,800-student district. Palo Alto administrators identified more than $770 million in renovation and expansion needs over the next 20 years. In determining the scope of a bond issue to pay for the project and the availability of contractors to perform the work, district administrators concluded that it could handle $40 to $45 million of new construction and modernization work per year.

"Factors that contribute to this determination include limitations on school site access, placing interim facilities on campuses, the number of bidders in the community and limits on district resources to support the construction program," the master plan says.

The plan prompted the district to schedule a $378 million bond election, and voters approved the measure last month.

Among the projects to be covered by the bond funds: replacing modular classrooms with permanent structures; upgrading climate-control systems; improving building security systems; seismic and ADA upgrades; and replacing furniture, computers and other equipment on an ongoing basis.

Many in the district had criticized previous capital-improvement efforts for failing to address the replacement of furniture and equipment.

"Many criticisms … involved the lack of new furnishings and equipment being provided," the master plan states. "[S]taff and faculty were stuck with old desks, chairs, projectors, computers and other equipment that was not on par with the standards of today. A significant investment in this area is necessary not only for the accelerating rate in technological advances, but for the lack of investment made during the past several years." ■

Kennedy, staff writer, can be reached at mkennedy@asumag.com.

Fixer-upper?

For some schools and universities, indecision over whether to renovate an existing facility or construct a new building can stall progress.

The Ohio School Facilities Commission (OSFC), which allocates construction and renovation funds to local districts, has put together a brochure examining the "renovate or build new" question. It includes a list of questions that administrators should consider before deciding which path to take:

- Does the building have historical significance?
- Do the costs of rehabilitating the facility outweigh the costs of building new?
- Can the facility be renovated to accommodate 21st-century instructional delivery practices and modern technologies?
- Are there parts of the building that should be retained? Are there sections that should be replaced?
- Is the facility properly sized for the school population of today and of the future?
- Is the building well-lighted, spacious and comfortable?
- Will the facility be operationally efficient?
- Does the environment impart a feeling of safety and well-being?

"One of the most important decisions a school district must make when participating in an OSFC project is whether to renovate an existing facility or replace it with a new school," the commission states. "There are costs and benefits to either choice, and the community must weigh all of these factors in their decision. Although it is recommended that a building be replaced should it be very costly to renovate, OSFC recognizes that a school facility could have historical value or may serve a special function in a community. Should the district and the community choose to retain their current buildings rather than construct a new school, OSFC may approve renovations and expansions that cost up to the full amount of a replacement facility."

The brochure is at www.osfc.state.oh.us/pdfs/Brochures/Renovate.pdf.

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Although green roofs tend to be relatively low-maintenance, they do have specific needs.
Photo courtesy of GreenGrid

The Big Top

With proper care, maintenance and planning, green roof systems can provide a variety of benefits to education institutions.

By Jared Markham

Schools and universities throughout the United States now appear to be embracing green roofs as one of many environmentally friendly initiatives. This living rooftop, with all its associated benefits, has been something many have long wished for and has finally become a reality.

Once a green roof is in place, school managers soon realize they are not the same as typical landscaping. Although they tend to be relatively low-maintenance, the location and highly specialized plant types of a green roof mean that facilities personnel must learn how to care for and maintain these new systems—an aspect that sometimes can be overlooked during planning

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and installation.

Because a green roof is a living part of the building envelope, occasional to regular maintenance (depending on the scope of each project) is as vital to the success of the green roof as the objective, design, plant selection, climate and other project specifics. The question becomes: How do schools most effectively maintain a green roof?

This question has financial implications—the initial investment to install a green roof can be as much as two times that of a conventional roof. Proper maintenance increases the likelihood of a successful green roof project, making the return on investment well worth the upfront cost of the roofing system. Further, when the cost savings for heating and cooling a facility crowned with a green roof enter into the equation, a green roof becomes an even better value—but again, only when maintained properly.

Types of green roofs

Maintenance decisions for green roofs may be influenced by the type of system installed: extensive (or low-profile) and intensive (or high-profile). Extensive green roofs, the most common type installed today, are lightweight systems with thin layers of drought-resistant, self-propagating vegetation, usually requiring little or no irrigation or fertilization after establishment.

Vegetation for extensive green roofs should grow as a groundcover to cover the soil surface, usually within two years after being planted. While 4 inches of soil media is the industry standard for extensive green roofs, they may vary in depth from 2 to as much as 6 inches of engineered growth media. Aesthetic decisions can influence the overall design, but the primary goals of an extensive green roof are for it to be self-sustaining over time, with limited routine maintenance and relatively low capital costs. Drought-tolerant vegetation, usually composed of various succulent types, is planted and grows quickly over the soil surface. Because of the self-propagating nature of many varieties, one economical method of re-establishment or addressing bare spots is to distribute cuttings from established plants across the bare areas of the roof and keep them moist until roots have developed.

Intensive green roofs most often are intricately designed roof landscapes and may require all the expected attention and maintenance concerns of ground-level landscaping. The growing media for intensive roofs ranges from about 8 to 12 inches, but can measure beyond 10 feet, depending on the loading capacity of the roof, and the architectural and plant features desired by the building owner. Regular maintenance will be required for these applications.

There are built-in-place systems where the green roof essentially is built on top of an existing roof, as well as modular systems available for both intensive and extensive green roofs. With a modular system, the growing and plant media are preplanted into 100 percent recycled plastic modules that are then lifted and installed directly onto a roof for an instant green roof. The process tends to be more streamlined and, as a result, less labor-intensive, thus potentially lowering installation costs. Built-in-place systems often are selected where very deep soils are required, on steeply sloped roofs, or in instances where extremely curvilinear designs are specified.

For most green roof applications, however, a modular system should be evaluated given the potential cost savings and ease of future waterproofing maintenance. A building actually can be reroofed and the green roof easily staged for reuse when a modular system is installed.

Preliminary considerations

Care and maintenance concerns begin before a green roof is installed. The contractor, engineer or green roof manufacturer will have to conduct a preliminary inspection to determine whether the existing roof can support a green roof. The wet weight of a built-in-place green roof can range from 15 to as much as 50 pounds per square foot; the wet weight of a modular system, a newer technology, often is lighter, ranging from roughly 15 to 18 pounds per square foot for a 4-inch-deep module, to 30 to 35 pounds per square foot for an 8-inch-deep module. Whichever system is used, an expert should be brought in to ensure the green roof's weight will not jeopardize the structural integrity of the building.

Furthermore, especially when installing a built-in-place green roof, some type of irrigation system (typically temporary, but occasionally permanent) may be required to ensure proper plant rooting and survival. Depending on the location and project, some green roofs such as modular systems allow for pre-establishment, potentially minimizing or eliminating the need for regular irrigation during the first four to six weeks after installation.

To maximize plant survival and maintain reasonable levels of post-installation maintenance, including watering, the best time to install a green roof in most temperate parts of the country is between April 1 and October 15. Southern climates have a longer growing season, thus a wider window for green roof installation; however, areas that routinely experience midsummer heat waves or droughts may want to avoid green roof installation at this time. Pre-established modular systems can be more flexible with installation dates if the plants are well-rooted. To avoid costly rework or repairs, especially with a layered, built-in-place system, a green roof should be installed only over a new roof or one that is deter-

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mined to be in good condition.

Initial maintenance

Immediately after a green roof is installed, it's important to address plant irrigation. Temporary irrigation either in the form of an installed system or hand watering should be available for the first growing season and should thoroughly moisten the growing medium at least twice a week in the absence of natural precipitation. The vegetation then should be allowed to adapt to its environment by decreasing the watering frequencies to a monthly occurrence or only during drought conditions, depending on plant selection. The objective is for the vegetation to become self-sustaining in six months to a year. Availability of water when necessary is essential for the long-term health of a green roof system.

One common concern with having a living roof is the presence of undesirable vegetation (weeds). In time, it will be natural for some weeds to germinate and grow in a green roof system. Given the nature of most green roof media, hand weeding often is the most efficient and environmentally benign way to remove weeds and allow the intended plantings to flourish. Some school officials may think that any plant, weed or otherwise, on their green roof is acceptable, but it is important to realize that if weeds begin to take over the designed plantings, the likelihood of failure increases.

This happens for a couple of reasons. First, weeds generally are annual, and second, they typically are not as drought-tolerant as green roof plants. As a result, when the weeds die at various times during the year, significant portions of the green roof could be lost and require replanting. The root aggressiveness of some weeds, such as fast-growing trees (cottonwood, maple, etc.), also is a legitimate concern. Owners should be sure to obtain plant guides with pictures from their green roof provider so they can be sure which plants belong and which ones don't.

In the spring, some green roof systems may benefit from an application of slow-release fertilizer, preferably organic, to prevent excess nutrient runoff or the buildup of soluble salts. Cutting back ornamental grasses and removing leaves, branches and other unwanted debris is recommended so the green roof system can perform at the highest possible level. In anticipation of winter, school workers may need to drain and clean irrigation water lines prior to a freeze. Workers also should pull weeds before they flower and seed during the course of a mild winter.

It will be necessary to inspect the roof for debris and oversee its general well-being, including all standard roof maintenance and inspections (roof drains, flashing, etc). Some vegetation may need to be replaced or transplanted during the course of a year; climatic cycles will influence which of the green roof plants survive

It pays to be green

Three of the key benefits of a green roofing system:

•**Reduced energy costs.** When the outside air temperature reaches 80°F, surface temperatures of traditional black rooftops can be as high as 140°F. Rooftop heat loads affect the amount of energy necessary to cool buildings. Because of their shading properties and active cooling through evapotranspiration, along with the additional thermal mass of the soil media, green roofs have consistently and significantly reduced rooftop heat loads in warm seasons, even more than reflective white roof membranes.

•**Stormwater management**. Especially in urban areas, more than 75 percent of rain can become surface runoff, depositing pollutants into waterways. Many older cities have combined stormwater and sanitary sewers where, in the event of even moderate (half-inch or less) rainfall, the municipal treatment facility can become overwhelmed, resulting in discharge of raw, untreated sewage into local waterways. By both reducing the quantity of runoff from roof surfaces and delaying runoff that does occur, wide adoption of green roof technology in a municipality can limit these overflow situations and protect local rivers and streams, as well as public health.

•**Reduced urban heat-island effect**. The urban heat-island effect occurs in most large cities. Roads and buildings absorb a significant amount of heat during daylight hours. This heat, in turn, is radiated into the atmosphere, causing further warming. To compound the problem, additional heat is emitted by vehicles and HVAC systems that are working hard to cool these heated buildings. The urban heat-island phenomenon actually has been shown to change weather patterns in some of these cities and also can contribute to dangerous conditions for the elderly or children living without air conditioning. By cooling rooftops and the surrounding air, green roofs can help counteract urban heat islands.

To maximize plant survival and maintain reasonable levels of post-installation maintenance, including watering, the best time to install a green roof in most temperate parts of the country is between April 1 and October 15.

best. Generally, green roofs can thrive for years with minimal attention given the proper soil media and a mix of complementary vegetation.

Plants and growing media

Maintenance needs also will be determined by the selected growing media. Engineered growing media for green roofs has been refined in the United States in the past 10 years. It is made up of lightweight aggregates, micro- and macronutrients, and small amounts of organic matter. The growing media is designed to be lightweight; well-drained yet with adequate water-holding capacity for irrigation; physically stable over time; and able to provide sufficient nutrients to plant material. By contrast, traditional garden soil may not contain the proper amounts of nutrients, soil moisture properties, organic matter and other characteristics to promote plant vigor and ensure plant survival in the extreme environment of a rooftop in such shallow depths. Garden soil also will have a much wider weight range between dry and wet states, with wet weights dramatically higher than green roof media.

In Germany, where more than one of every 10 buildings has a green roof, studies show a slow reduction in the soil's organic matter each year. As a result, additional fertilizer may be needed on some green roof systems. A low rate of application using slow-release fertilizers is recommended by both the FLL (the Research Society for Landscape Development and Landscape Design: Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V.) German standards, as well as the American Society for Testing and Materials.

Yearly pH testing will indicate when the growing media should be amended. One indication that a green roof is too acidic is the establishment and growth of mosses. School facility managers will need to determine whether the moss is desirable. It can create lush green color during the cold season, but facility managers may not want to allow the moss to continue growing if it appears to be stunting the growth of desirable green roof plants or creating areas of exposed soil media if weather conditions result in moss death.

Most growth on a green roof will occur during the spring and fall months. Plants will bloom in the growing season, and plants can be selected to create a beautiful, multi-colored landscape that changes throughout the warm months. As fall approaches, some plants will change to common autumn colors; others—except for semi-evergreen varieties—will go dormant during the winter. All primary plants in a green roof system will be perennial and return

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Green roof plants can be selected to create a beautiful, multi-colored landscape. Photo courtesy of GreenGrid

NOTABLE

140°F Possible surface temperature of a traditional black rooftop when the outside temperature reaches 80°F.

when the weather breaks in spring. If winter aesthetics are a concern, a number of proven green roof plants that maintain winter interest can be included in the green roof design. ■

Markham is a LEED-Accredited Professional at Weston Solutions, West Chester, Pa., manufacturer of GreenGrid green roofing systems. He can be reached at jared.markham@westonsolutions.com or (860)368-3204.

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** Based on 2007 research by Noel-Levitz, "Factors to Enroll" study of college students in four-year universities.*

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9 Ready To Respond
14 Memo To Staff 18 Blogs

A SUPPLEMENT TO: ACCESS CONTROL & SECURITY SYSTEMS AND AMERICAN SCHOOL & UNIVERSITY

'08 SCHOOL SECURITY SURVEY

Strategies And Tools For Keeping Students Safe

RANDOM ACTS OF VIOLENCE at the nation's schools and universities may grab the headlines, but the top security concerns among education professionals are often centered on more mundane (and manageable) threats such as vandalism or students fighting.

When school violence hits the news, it can tend to raise security awareness among schools and colleges, and in some cases such an event can drive education institutions to re-evaluate

CONTINUES ON PAGE 4

TOP OVERALL CONCERNS FOR SCHOOLS AND COLLEGES

SCHOOLS (K-12)		COLLEGES/UNIVERSITIES	
Budget issues	83%	Budget issues	79%
Test results	83%	Finding good students	77%
Technology incorporation	76%	Technology incorporation	64%
Finding/retaining teachers	70%	Finding/retaining professors	62%
Security	65%	Security	62%
School infrastructure	63%	School infrastructure	48%
School overcrowding	31%	Test results	39%
		School overcrowding	18%

Although important, security ranks below other concerns at both K-12 schools and colleges/universities.

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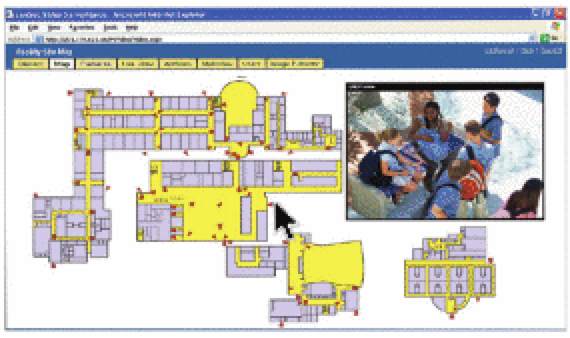

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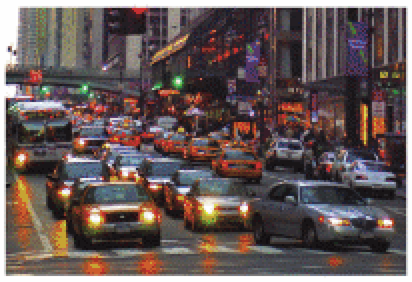

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Strategies And Tools For Keeping Students Safe

(CONT.)

and review their security efforts. But more likely, a school's security plan has already been updated in the last year either because of a scheduled or routine review or because of industry standards or benchmarking.

Concerns from parents, teachers and students can also drive security planning efforts, as can requests from the school board or another school official.

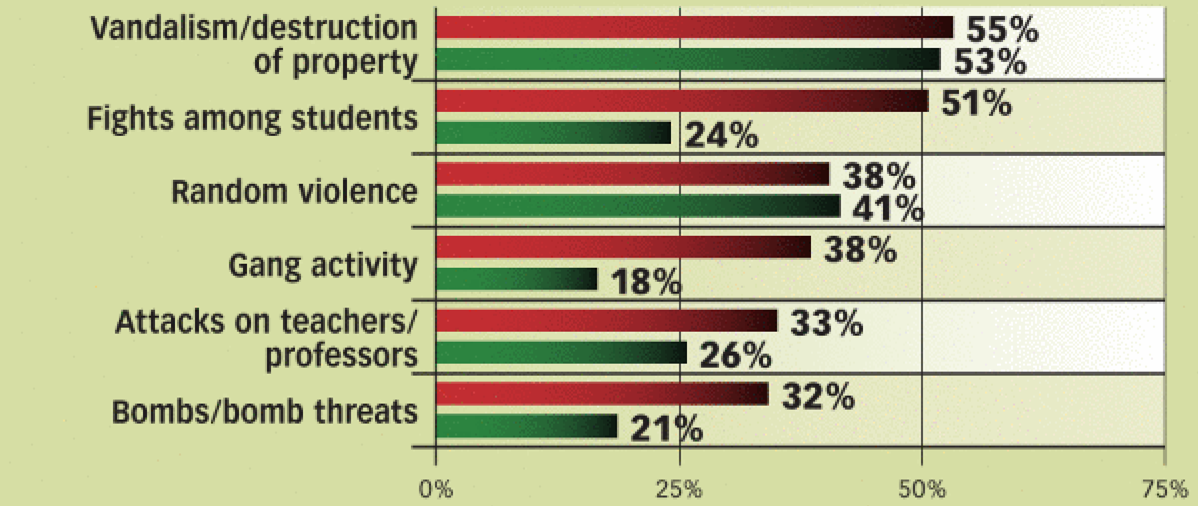
Security continues to be top-of-mind, and education professionals have noticed that security incidents are more frequent, some say more severe. Education institutions are spending more money than ever on security concerns, and the increases will continue, with part of that money being spent on a laundry list of technologies to keep schools safe.

These are among the insights to be gleaned from the **Exclusive 2008 School Security Survey** conducted by *American School & University* magazine and *Access Control & Security Systems* magazine. The e-mail survey of school and security professionals sought to quantify important trends in the school security arena, and the results illuminate changes in how professionals can protect educational facilities .... and at what cost.

Check out our survey results on this and the following page. A total of 151 subscribers to the two magazines from K-12 schools and 97 subscribers from colleges/universities responded to our survey. ■

■ K-12 SCHOOLS ■ COLLEGES/UNIVERSITIES

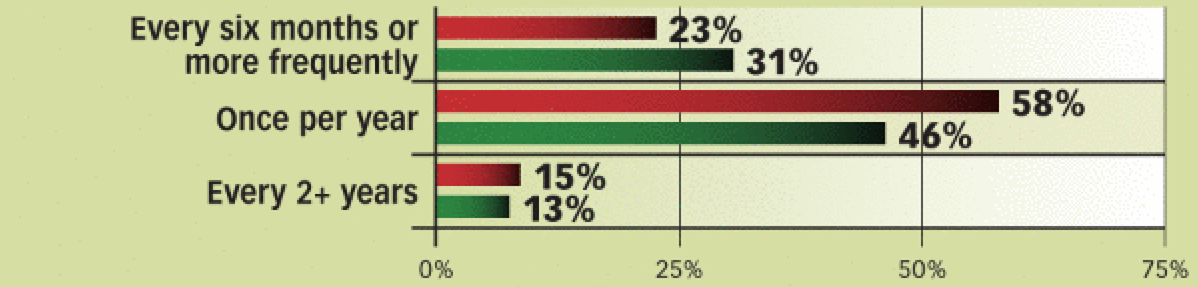
TOP SECURITY CONCERNS



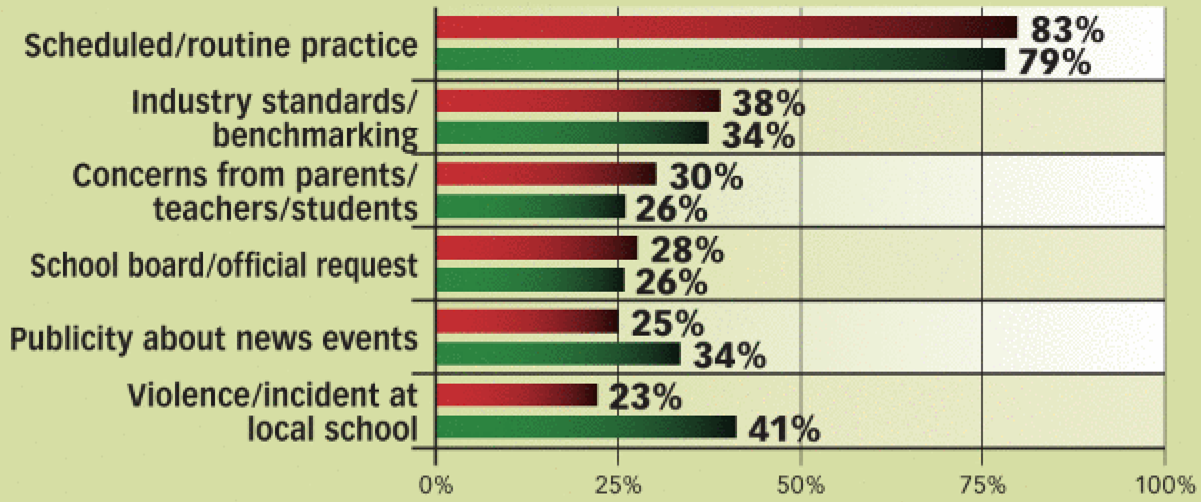
Property destruction is more likely a top concern than random violence, both at K-12 schools and colleges/universities.

TIME TO REVIEW?

How often do you typically review/update your security preparedness plan?



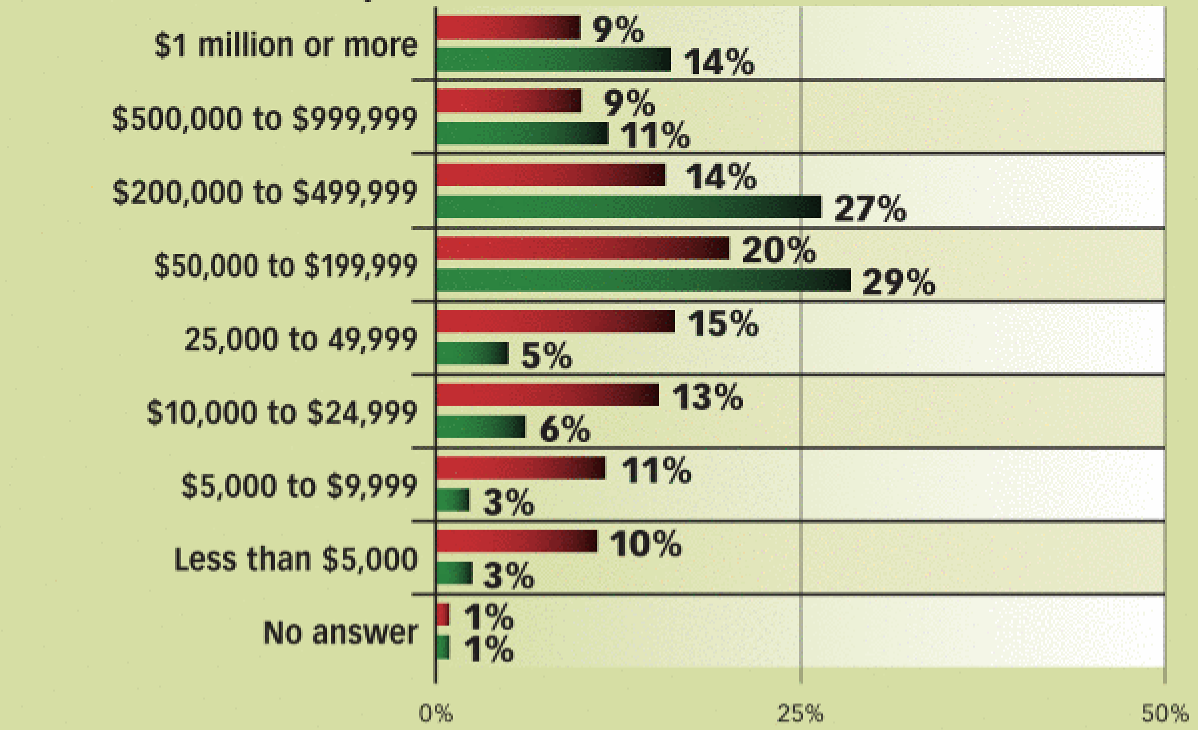
WHAT PROMPTS THE REVIEW?



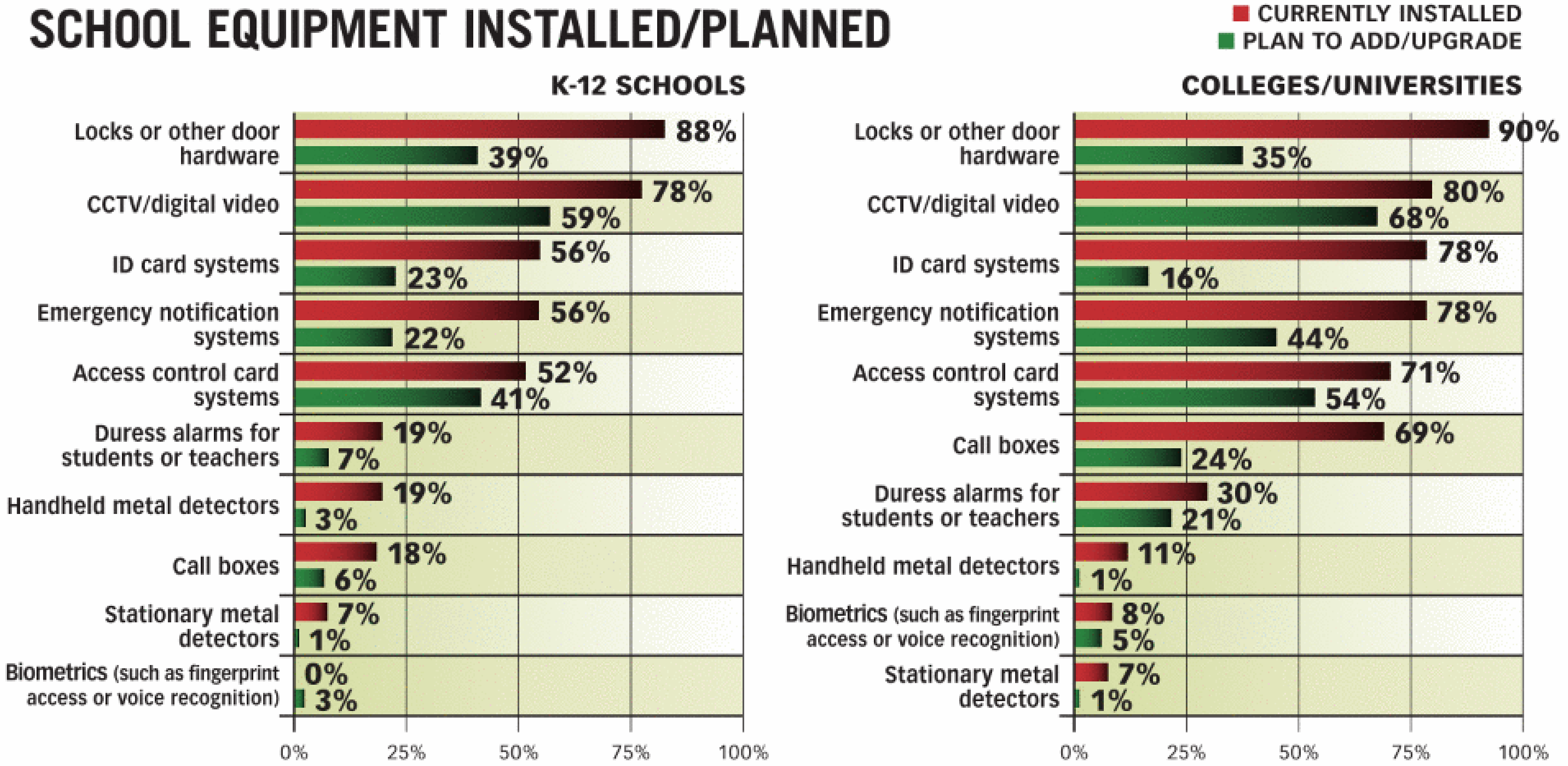
Security planning is more likely a routine practice at schools and universities, rather than a reaction to a news event or a local incident.

SECURITY SPENDING

How much did your district/college/university spend on security during the 2007-2008 school year?

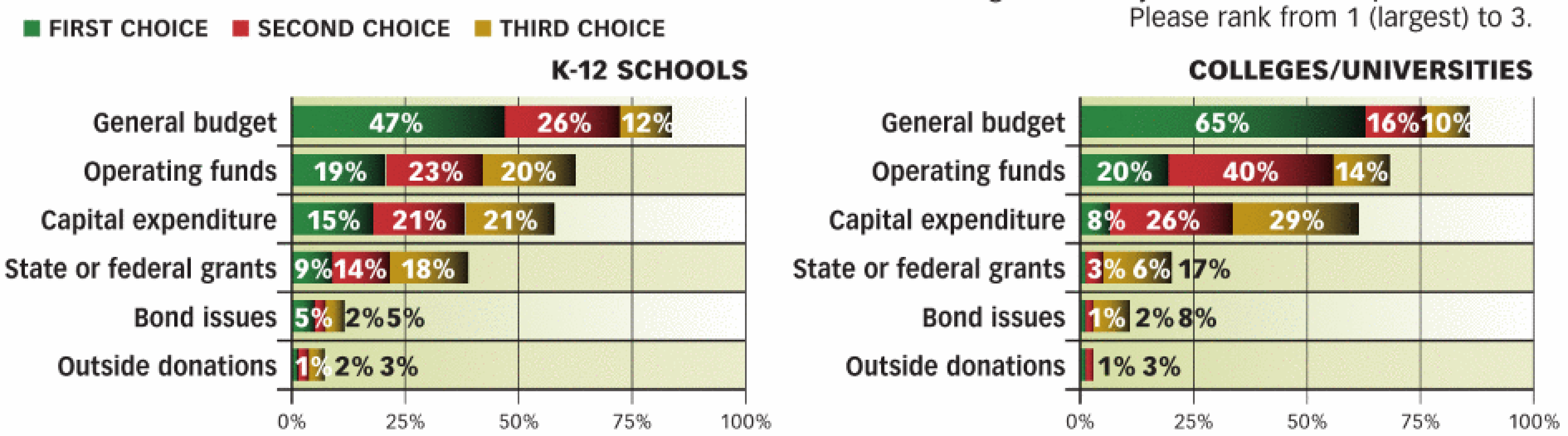


SCHOOL EQUIPMENT INSTALLED/PLANNED



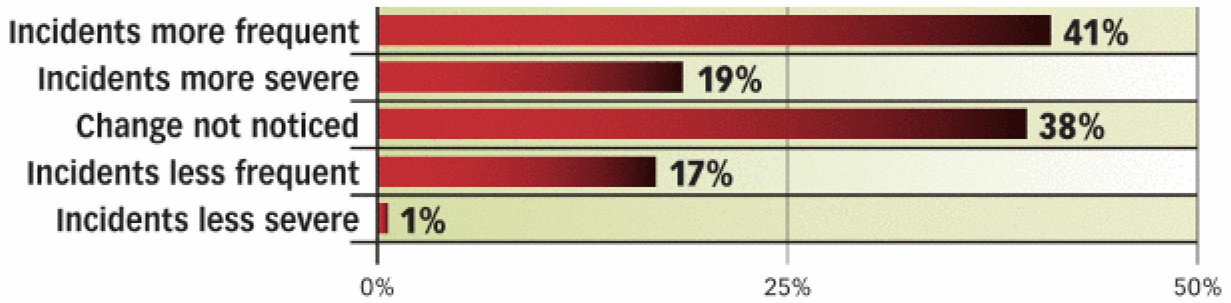
SOURCES OF SECURITY FUNDING

From which of the following sources do you receive funding for security measures and improvements? Please rank from 1 (largest) to 3.



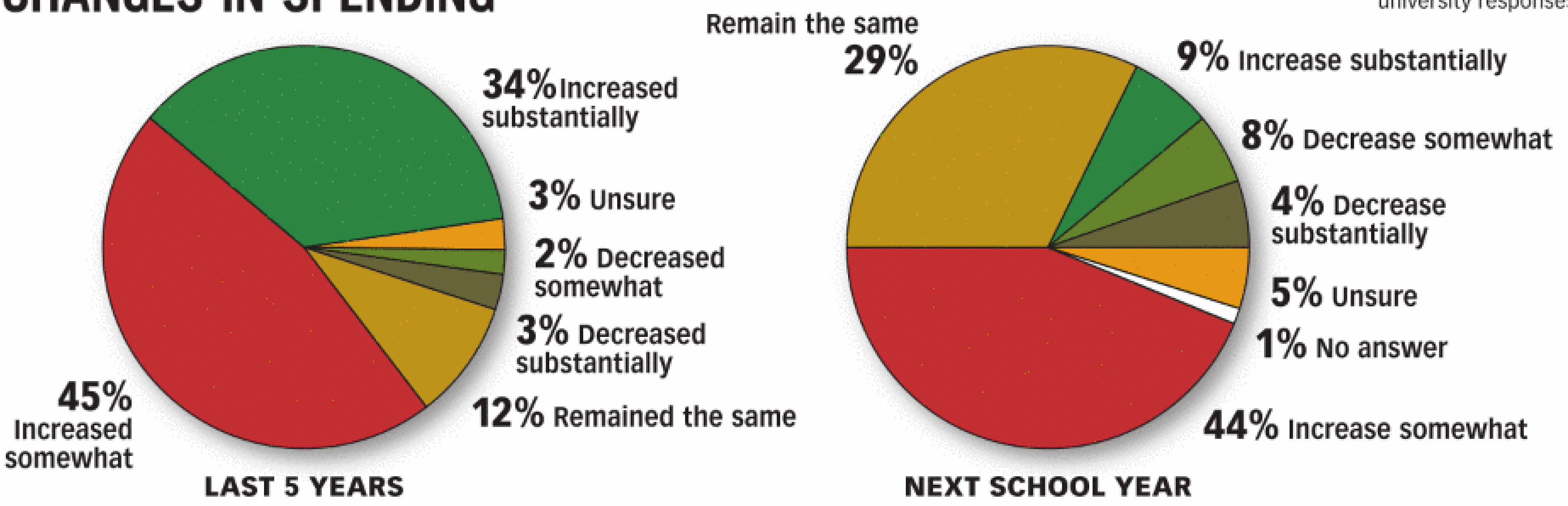
FREQUENCY AND NATURE OF SECURITY BREACHES*

*combined K-12 and college/university responses



CHANGES IN SPENDING*

*Combined K-12 and college/university responses



Operating In A New Era Of Campus Security

Experience has shown education administrators that crises and catastrophes can happen anywhere. BY MIKE KENNEDY

The deadly attack at the Virginia Tech campus in April 2007 is yet another horrific chapter in the ongoing story of campus security. The possibility of extreme violence is the new reality for students, staff and the rest of the education community.

The task for school and university administrators is to adapt to that new reality and try to find ways to prevent such events from recurring. The plans will be imperfect. However, in striving to correct flaws in their emergency preparedness plans, school officials may be able to prevent a violent episode or intervene before it leads to tragedy.

"While we can never eliminate the threats posed to our campuses by crime or disaster, natural or person-caused," Missouri Gov. Matt Blunt's Task Force on Campus Security says, "we can and must mitigate impact through effective all-hazard emergency preparedness."

Reviewing plans

The desire for answers and to learn lessons from these tragedies drives education administrators and security professionals to sift through the evidence and find ways they can plug any holes in their security plans and emergency preparedness.

Missouri was one of many states that reacted to what happened at Virginia Tech by re-examining the readiness of crisis plans on its own campuses. In addition, federal agencies and other organizations have stepped forward with recommendations for improving campus safety.

When an attack occurs that is as horrific as the one that befell Virginia Tech, the immediate response of many government and education officials is that something must be done — crisis plans reviewed, recovery efforts bolstered, more security personnel deployed, more access control and surveillance equipment installed and more prevention programs initiated.

The responses to crises will vary from school to school and depend on the conditions and characteristics of each campus. As the Missouri task force notes, a research institution housing a nuclear reactor has security needs vastly different from a small liberal arts school in a rural area.

In North Carolina, the Campus Safety Task Force focused its report on the four phases of crisis management: prevention, preparedness, response and recovery. The report recommends that campuses establish threat assessment teams to help faculty, staff and students recognize signs of mental illness and improve their awareness about the resources available to help people who are a danger to themselves or others.

"Identifying potentially violent students as early as possible is one of the best preventive measures a campus can take," the North Carolina report says.

One of the issues that arose after Virginia Tech was whether schools and universities risked violating student privacy if they shared information with other agencies about a student viewed as a potential threat. In response, the U.S. Department of Education is revising the guidelines related to the Federal Education Rights and Privacy Act to clarify to what extent schools are allowed to provide private student information to others.

Schools should strive to remove the stigma associated with mental illness so that troubled students can seek treatment.

"Colleges and universities must challenge the prevailing social norms of students that frown upon seeking help," the Missouri task force says.

In addition, campuses should make treatment more available. "Emotional crises often happen at inconvenient times, when students and other members of the campus community lack access to high-quality mental health services," the task force says.

A common language

To improve preparedness, schools and universities should make sure their emergency plans are compliant with the National Incident Management System (NIMS) created by the U.S. Department of Homeland Security. NIMS establishes standardized procedures for emergency responders.

"With responders using the same standardized procedures, they will all share a common focus, and will be able to place full emphasis on incident management when a Homeland security incident occurs," the department says. "In addition, national preparedness and readiness in responding to and recovering from an incident are enhanced since all of the nation's emergency teams and authorities are using a common language and set of procedures."

The Missouri task force notes that

the Federal Emergency Management Agency (FEMA) offers training in NIMS and its Incident Command System (ICS), but "these resources often go untapped by senior executives who will be required to serve as incident commanders in a crisis."

The Missouri report recommends that each campus should designate someone to coordinate emergency operations and that person should make sure the school's "senior staff is trained in and familiar with NIMS and ICS."

Part of complying with NIMS, the North Carolina task force says, is making sure that a campus has established aid agreements so that outside agencies can assist them when a crisis occurs.

"All campuses, particularly those without sworn police officers, [should] develop and enter into agreements with key partners, such as local law enforcement agencies and first responders," the North Carolina report says.

The Missouri task force found that only 28 percent of higher education institutions had coordinated the development of their emergency plans with local law enforcement.

Getting the word out

One of the key findings in the reviews of what happened at Virginia Tech was that universities need to make a more exhaustive effort to spread the word about campus emergencies. Many have criticized the Virginia Tech response because campus officials, believing the assailant had left the campus, did not send out a campus-wide alert until two hours after the initial killings took place.

The International Association of Campus Law Enforcement Officers (IACLEA) spells out what it believes a campus notification system should include in a "blueprint for safer campuses" that was released earlier this year.

"Institutions should have an array of means and methods to disseminate information to the campus community during emergencies," the blueprint says. "Mass notification systems must include multiple means of sharing information, including high-technology and low-technology."

To maximize the effectiveness of a system, campus administrators and public safety officials need to have the ability to send emergency messages whether they are on or off campus, the association says.

IACLEA adds that education institutions should make sure such systems meet these criteria:

- **MULTIPOINT COMMUNICATIONS:** The system should be capable of reaching its audience through multiple points of contact, such as voice messages, e-mail, and text messaging.
- **CAPACITY:** The system vendor should have sufficient, demonstrated capacity to deliver all messages quickly and reliably.
- **CLIENT CARE:** A contract with a third-party vendor should include training, customer service and technical support.
- **EXPERIENCE:** A vendor should have significant experience delivering calls at institutions of various sizes across the country.
- **ASSESSMENT:** The service should have reporting capabilities that

allow the institution to monitor, manage and measure the system's effectiveness.

The association emphasizes that an alert sent out to the campus community should be timely, accurate and useful to the recipients.

Communication systems

When an emergency occurs on a campus, communication among various agencies is critical.

"Interoperable communication systems allow two or more responding agencies, even those using disparate communications systems, to exchange information directly," IACLEA states in its blueprint for safer campuses. "With interoperability, on-scene personnel can quickly access each other to coordinate needed rescue and emergency activities."

The North Carolina task force recommends that campuses partner with law enforcement to ensure interoperability. Illinois has created a Statewide Radio Communications for the 21st Century network (Starcom21) to provide first providers with a single interoperable communications system. The state has provided more than 300 Starcom21 radios to 70 higher education institutions, including Northern Illinois University, which used them when responding to the fatal shooting of five people on campus in February 2008.

Emergency plans should include provisions for counseling services after an incident, the North Carolina task force says. That is especially true for victims and their families. A survey by the North Carolina Department of Justice found that 81 percent of college campuses in the state had developed plans to provide counseling to students, staff and faculty after a crisis, but only 39 percent of campuses had a plan to communicate with victims and families after a crisis.

Technological help

Schools and universities are finding that technological advancements can help them carry out their emergency plans more effectively and keep campuses safer.

"Equipping campus facilities with electronic card access and key systems, and customized access privileges for students, faculty and staff is one infrastructure measure that greatly enhances the security of a campus," the New Mexico Governor's Task Force on Campus Safety says. "Integrating all security systems into a single network will make monitoring more effective, reduce theft and vandalism and help people feel safer on campus."

Other security equipment and strategies that schools and universities should consider, the task force says, include cameras, remote panic stations, lighting, landscaping and designation of safe areas. The most effective time to include such security is when schools are planning their facilities.

"In the post-9/11 world, the public has an expectation that colleges and universities will take reasonable steps to provide safety for campuses," the New Mexico report says. "In order to fulfill this expectation, it is critical that security components and standards are considered as buildings are designed." ■

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LEFT: Heritage Tower Fountain on Florida State University campus, Tallahassee, near the T.K. Wetherell Building. Photo by Bill Lax/FSU Photo Lab

ABOVE: Memorial Union, a landmark of the University of Missouri campus. Photo credit: MU Publications and Alumni Communication photo

Ready To Respond

On campuses across the nation, emergency management personnel have intensified their efforts to ensure schools are safe. BY MIKE KENNEDY

Tragedies such as the fatal shootings in February in a lecture hall at Northern Illinois University in DeKalb or last year's deadly shooting rampage at Virginia Tech can serve to remind emergency management personnel at other campuses of the need to assure their communities that they have plans in place to address such incidents.

Because of the enormity of the Virginia Tech massacre, most education institutions — on their own or under pressure from their communities — have undertaken a review of their emergency management systems to see whether they are working to prevent such catastrophes or can address such a crisis effectively if one occurs.

American School & University and *Access Control & Security Systems* magazines asked emergency management personnel at several campuses to describe how they are dealing with campus safety in the wake of recent events:

AS&U/AC&SS: *What are colleges and universities doing in the aftermath of the Virginia Tech and Northern Illinois University incidents to make their campuses safer?*

DAVE BUJAK, emergency management coordinator, Florida State University (FSU), and chairman of the University & Colleges committee of the International Association of Emergency Managers (IAEM): There has been a lot of review and analysis. We have a wide gamut of topics to address including law enforcement, notification and mental-health identifying. We feel that we're pretty far ahead at FSU.

JACK WATRING, chief of police, University of Missouri, Columbia: We're still in the process of making improvements. We were doing a lot of those things already. Since Virginia Tech, we have had a lot of tabletop exercises such as setting up the exact scenario. Things have sped up since 9/11 and Virginia Tech. It has changed how often we do exercises in the field.

JUSTIN HENDEE, emergency management coordinator, California State University, Fullerton: Our officers have undergone training for how to respond to an active-shooter situation. At the same time, the rest of the campus had shelter-in-place training. Our basic thing is public education. We're now putting together a Web-based presentation that will give students and parents an idea of what to expect when they come to campus. We're also looking for other avenues to get training and information out to students and parents.

SCOTT BULLARD, director for emergency services, North Carolina Community College System: On the response side, you're only as good as your planning efforts. I take an all-hazards, comprehensive emergency management approach. The focus is on what the response should be. The incident isn't always a major crisis. It could be a water main break or a power outage.

AS&U/AC&SS: *Do your institutions have systems in place to notify the campus community in the event of an emergency?*

Bullard: Just like after 9/11, we had a landslide of folks trying to sell us products after Virginia Tech. I'm not sure if there's a prevailing product for notification systems out there. A lot of the schools are looking at products with dual uses—ones that can also send notices when classes are canceled or when a fee is owed. You have to get people to register. It can be a problem when folks aren't living on campus and if they have a wireless phone that's not listed with the school.

Hendee: Our mass notification system can send text, e-mail or phone messages. All 37,000 of our students are signed up automatically. The response has been overwhelmingly, 99.9 percent positive. We don't use it for routine messages like "this is the last day to drop a class." The students and staff know that if this thing goes off, their safety is in jeopardy. We also can use an external public address system that is controlled from the police dispatch. The internal fire alarm system has one-way communication.

Bujak: Florida State has identified a brand for our system FSU Alert. We have more than 20 emergency contact methods. Some are primary (university online homepage, outdoor sirens, weather radios, text messages, e-mail, blue light safety phones, campus hotline, visitor information radio, voicemail, reverse dialing and computer network pop-up windows), some are secondary (two-way radios, variable message boards, electronic card-swipe door access, cable TV information channel, television, radio, online campus newspaper, vehicle public address speakers, network login pages, voice-over fire alarm system, media releases and Facebook and MySpace pages on the Internet). Many of these emergency notification methods

have existed for a long time, but most schools don't realize it or think about them in that context. The system has been extensively tested and advertised. That has been our big project for the year.

Watring: The university system as a whole (Columbia, St. Louis, Kansas City and Rolla campuses) has a new system to notify students, faculty and staff about unusual occurrences. The university is trying to get our students, faculty and staff signed up to the system so they can receive messages. I think we're getting the word out there.

AS&U/AC&SS: *What do administrators need to consider when choosing emergency notification systems?*

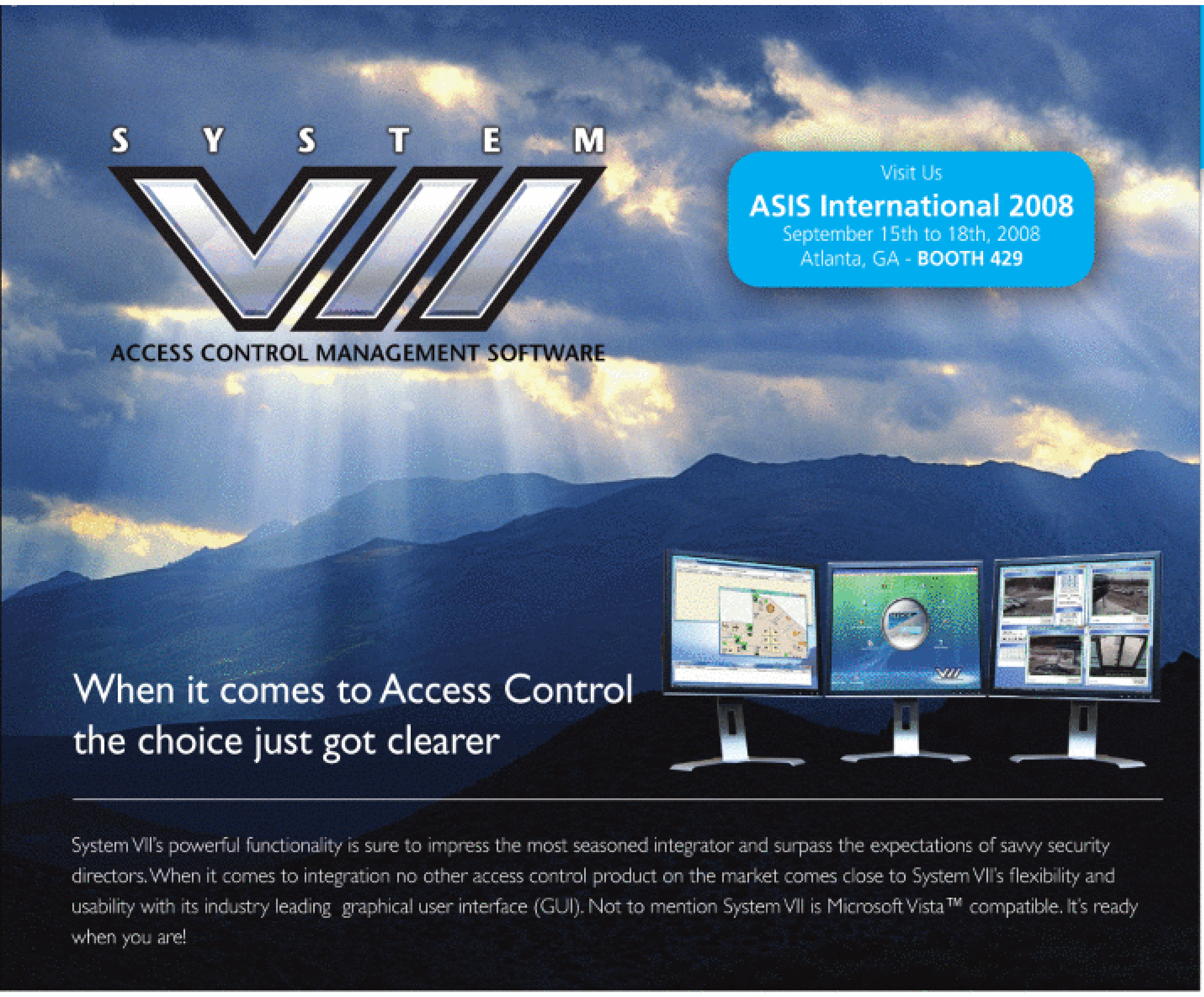
Bujak: Do you want mass notification or a targeted notification to a certain building or group of individuals? Do you want the notification to be active or passive? A siren you hear whether you want to or not? With e-mail, you have to log in; with a phone, you have to answer. You have to look at speed versus accuracy. A siren is instantaneous, but the ability to say a whole lot with it is non-existent. What will be the urgency of the messages? With hurricanes, we have days to get prepared and make decisions. For an active shooter situation, you don't have the luxury of minutes or hours to get a message out. Who decides when the system is to be used? At Florida State, we have five pre-approved situations (such as flooding or a tornado) in which a message can be sent out. We didn't want to have a convoluted approval system that would take hours before a message could go out. Who needs to be notified? The faculty? Just one building? Only students?

AS&U/AC&SS: *What are some of the other steps schools have taken to enhance the safety of their campuses?*

Watring: We are working on how we treat people who are mentally ill. A lot of people are paying closer attention to at-risk behavior. Now, we have a student behavior task force. Every week, we meet with people from the counseling center, from student affairs, judicial folks, police offices and people from student health. We talk about whom we are having problems with. The

Langsdorf Hall at California State University, Fullerton. Courtesy of California State University, Fullerton.

PHOTO BY PHIL CHANNING



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Westcott Building on the campus of Florida State University, Tallahassee. Photo By Michele Edmunds /FSU Photo Lab

counselors can't disclose some of the things they know, but if something comes to our attention, it usually is a matter of public record, and we can pass that on.

Bullard: Schools should look at using the social networks that students themselves have built. There's concern that students aren't signing up for a notification system, but when you actually shoot a message out there, it gets to a lot more people. It's like the old 'tell two friends' system except it's at the speed of light.

Hendee: You need to use a combination of everything. To be truly prepared, you need to have threat assessment tools on campus. When an individual is identified as a potential risk, we have a consultant that does a profile to determine the level of the threat.

Bujak: The [University & Colleges committee of the IAEM] is putting together a Higher Education Incident Management team that can come to the aid of other schools in the event of an emergency (e.g., helping to get a registrar's office reopened or classes rescheduled). People with administrative or facilities and maintenance experience who understand how business is done on a campus would be on this team, and schools can call on this team for assistance. The committee is also working on developing guidelines and best practices for college emergency management programs.

Since Virginia Tech, the attention on security has faded somewhat at the upper administration level, but at the worker-bee level, such as police, emergency management and campus counseling officials, we are still focusing on what needs to be done.

AS&U/AC&SS: *What are some of obstacles schools face in enhancing their emergency management systems?*

Bujak: We have a wish list of about $1.3 million. We want to move indoors with our public address

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system. We're looking at Voice-over-IP systems that we would use in our most populous buildings. We also want to extend our siren system to off-campus property. We have intramural fields that on a good night have 800 to 1,000 students using them, but they are 5 miles from campus and they're out of the range of our sirens.

Also, the cell phone infrastructure in Tallahassee isn't there. There aren't enough cell towers to handle the volume when we're trying to send 46,000 messages in a 450-acre area. It took us four hours. You might get a text message in a couple of minutes and the person next to you might not get it for a couple of hours. That's why redundancy and multiple systems are important.

Watring: We could always use more personnel. I'm sure that every campus in Missouri would like to have more personnel. We also are trying to get all colleges and universities in Missouri to have sworn police officers. We're still looking at things, like electronic billboards in each building that would post alerts and warnings.

Bullard: The mental health side of the house has not been adequately addressed. People are a little bit hesitant to get involved with that. With 58 schools and 800,000 students in the North Carolina community college system, it's harder to develop a consensus. You can turn the train, but it takes a while to turn it around. Also, in a community college system, we have a mostly commuter student population, and it's very difficult to keep track of everybody. In our system, whether campuses are large or small, they are tied in to their communities. You don't want to stymie the education process, which could happen if you lock down a campus like a prison.

Hendee: Out of 37,000 students, only 800 are residents on campus, making it more difficult to reach out. That's why we try to use the Web. We have also done about 45 presentations to students and parents.

AS&U/AC&SS: *Is the focus on active-shooter incidents after Virginia Tech and Northern Illinois taking too much attention away from plans to address other types of emergencies?*

Watring: In the police business, you have to be prepared for any eventuality. We need to know what to do if there's an active shooter, a natural disaster, a fire, an evacuation, tornados or floods; we need to know how to handle it.

Bullard: We remain focused on natural hazards. North Carolina as well as our sister Florida has been tested by hurricanes. You have four days notice, and there aren't a lot of excuses for not at least being able to do some things such as evacuation. You can make decisions a few days in advance. You're only as good as your planning efforts.

Hendee: I think with the way things have been emerging, campus violence is just another facet of the campus safety plan. It just dovetails into our emergency response plan.

Bujak: We (on the IAEM committee) find that a lot of schools and their emergency management systems are heavily centered on law enforcement. In California, Oregon, Washington (because of earthquake threats) and here in Florida, because of the hurricane threat, our approach is more all-hazard in nature. ■

Mike Kennedy, writer for AS&U magazine, can be reached at mkennedy@asumag.com

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Memo To Staff

You are all members of the security team. Here's how you can maximize your effectiveness. BY STEPHANIE SILK

Staff and students play a variety of roles in schools and universities, and many of these roles can affect security, for better or worse, according to school security consultants interviewed for this article.

Custodians and janitors, front office staff, administrators, teachers, nurses and social workers, food service, bus drivers and even students are all part of the security team. "It's vital to remember that in most situations, people in the building are the first responders, not the people outside," says Paul Timm, PSP, president of RETA Security Inc.

Awareness is key in maximizing security effectiveness. "We can never lose by heightening awareness; whether it's making sure the school newsletter mentions a security/safety briefing, or if the school sends out the occasional e-mail. With awareness, collaboration of a safety committee and hardening your target, we can stop these situations," Timm says.

Check out the many security roles of various members of the education community — and be sure to share these expectations with the "front lines" of school security.

Custodian/Janitor

• Remember, you are the only person who knows the building inside and out.

• You are not tied to students, giving you mobility in the building. With this mobility, gain knowledge of things such as how to get on the roof, where a closet leads or where someone can get hurt.

• You, and only you, have all key control.

• Learn which staff members have what keys and access to what doors at what hours of the day. And although teachers should lock the doors—you should notice if it wasn't done.

• Make sure exterior lighting is bright and lit; trim shrubs and trees; and maintain doors and door hardware.

• Be the eyes and ears of the school, and alert someone to any unusual happenings.

• Build a relationship with the teachers. If a teacher doesn't allow students to throw trash on the floor to make your job easier, take responsibility for the teacher by noticing a room full of kids without an adult, or a wandering student.

• If you are working at night during a non-school event, control access to the building just as you would during the school day.

• Suggest training to your school administrators. If you are working at night, you should be trained in CPR and First Aid if there are any events in the building.

Front Office Administrative Assistants/Secretaries

• You are the next barrier an intruder has to break after he or she gets past the front door. So, it is vital

that you check and verify all visitor IDs whether it's by paper or a technological device. There are still "parents" who come in and say they want to just "deliver something to their child." As a gatekeeper, all things will fall apart if you don't follow the same rules for everyone.

• Do not leave out the sign-in tools including badges and the sign-in book in reach of visitors.

• Protect information as well as people—do this by not allowing access to the personnel directory. If someone knows his or her victim is in a certain district, but doesn't know which school, he or she can look in the directory for confirmation.

• Everyday items you leave on your desk—scissors, a letter opener—should not be in grasp of any visitor, especially a walkie-talkie or other form of communication. If a problem individual comes in and you react by looking at the radio instinctively, they will know to steal it and shut down communications, rendering you helpless.

• You are on the front lines: If you handle mail, learn the suspicious mail and package rules and what to do if you encounter it. The transfer of contaminated mail would come back to you. If you answer phones, keep a bomb threat checklist at arms length.

• In case of a lockdown, do not render yourself responsible—you should not be on the sweep team. The sweep team will be made up of volunteers. Also, do not consider your desk or a near closet to be a good hiding spot. Learn where you can go that best fits your safety needs.

Administrators

• Give your students consistent discipline. If you consider constant detention enough of a punishment—remember that each time the student repeats an offense, he or she is making themselves more of a threat.

• If you leave the school, there's a chance the rest of the school doesn't know whom to turn to in an emergency. Delineate security responsibility (before an incident occurs—not during) in your absence and keep a running tab of who manages what security function during that time. Tell your staff when to call you and when to go straight to the police.

• There are certain policies that may enhance security, including not allowing teachers to put students' names on the walls outside of the classroom. Only you have the power to create and enforce these policies. Do not expect teachers to do it on their own without formal notice.

Teachers/Staff

• Leave convenience in the past. Once you prop open a door to the outside to let in fresh air or take the class on a walk, the safety of the school is in your hands.

• You should familiarize yourself with the "Wal-Mart approach." If you see someone in the hall that you do not recognize, address him or her by asking how you can help—even if you assume they have already been authorized. You can be as much a part of visitor management as the front office is.

• Even though an empty classroom seems to be an empty threat, there is still information left behind while you are at recess or lunch that intruders can steal and use.

• Request training from your school in many areas. You should know how to use a defibrillator and be ready and willing to operate one. You should also be trained in current technology trends. You should know that an iPhone looks like an iPod—but a phone can be a security threat. You should know that there are some ringtones that you will not be able to hear solely based on your age. And you should know how to teach your students that putting personal information on a social networking Web site can be a danger to the school.

• You should also request supervision and line-of-sight training. If you walk 10 students down the hall and turn a corner, did you just lose sight of the 10th student?

• You should also be familiar with Crime Prevention Through Environmental Design (CPTED) and creating natural surveillance. For example, if your classroom windows face a parking lot, tip the shades up so people outdoors cannot see in.

• Be aware of how easy you have made it to find a child in your classroom for a stranger. Ask yourself, if someone has already bypassed your school's screening mechanism, how will they find that child? The intruder may know the teacher's name from a conversation with the child, artwork may be placed outside the classroom or in the media center with a name on it or photos may be on display in the hallways.

• Schools should not mark parking places with your name. This makes you a target. The intruder may not have been able to access the school—but then he or she will

If you walk 10 students down a hall and turn a corner, did you just lose sight of the 10th student?

stay at a parking spot waiting for you after hours.

Food Service

• Back doors are as much of a threat as front doors, and some of these doors may be located in the cafeteria. Maintain a screening system similar to the front of the school by keeping these doors locked and only open upon a doorbell system or a peephole.

• Food can present dangers itself—think about what or who has access to it. Contamination is common around self-service bars.

• Position self-service bars near security cameras, and position yourself in order to enhance natural surveillance.

Nurses and Social Workers

• Keep emergency supplies in more than one location.

Know where individuals with emergency skills (CPR-certified, bilingual) are in the school at all times of the day.

• Have a list of "inventory skills" or individuals in the building who have emergency skills, such as being bilingual, being certified in CPR, having a CDL license to drive a bus or being trained in conflict resolution. Know where these people are located at all times of the school day.

Students

• You are the largest stakeholder representation in the school. It is up to you to share information. You hear more ear-to-the-ground information than anyone else—in classrooms, hallways, bathrooms, etc. Suggest to your teachers and peers to start an anonymous tip line so that you keep yourself out of any danger. You can blow the whistle on plots. ■

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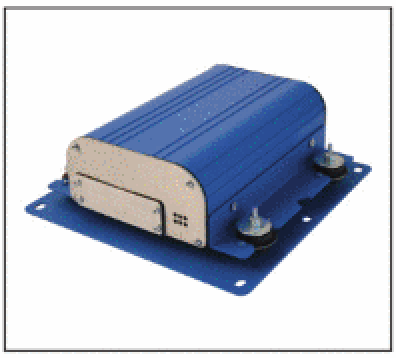

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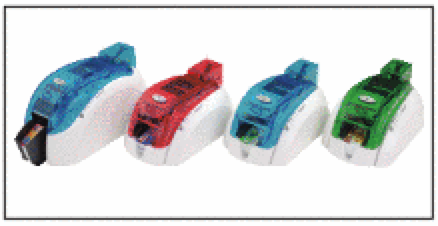

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An Open Forum

Blogs provide an outlet for communication about schools and security

BY STEPHANIE SILK

The latest outlet of communication on the Internet consists of blogs or, “modern online diaries.” Readers can now use blogs to respond to the news they read—posting comments, discussing through message boards, taking polls and e-mailing responses.

Related to school security, blogs give readers the opportunity to learn and participate in news about school security in real-time.

Schoolsafetynews.com

Brad Spicer is founder of SafePlans, a risk management consulting firm, and runs SafePlans' School Safety News Blog and Map (schoolsafetynews.com). The site's School Safety Incidents Map (see below) provides situational awareness through the posting of school safety-related incidents and success stories. Icons on the map indicate where security situations from pre-K to colleges have happened, including incidents involving intruders, need for lockdown, school shootings, IED or bomb threats, fire evacuation, damage to schools from weather or bus accidents.

The blog, aimed at the K-12 market, was designed to educate stakeholders on best practices and to inform them on the need for better school security. “There are some school administrators and parents who understand the need for improved school safety,” Spicer says. “But there are also those who are in denial—and this is for them too.”

To educate stakeholders, the blog analyzes school safety hazards and real-world incidents while illustrating how improved planning, training, tactics and/or technology can be implemented.

Spicer updates the blog two to three times a week by posting entries that focus on a news item (“Bomb Detonates at California High School”) or a security subject (“Secondary Attacks and Their Countermeasures”). He follows it with knowledge on the subject, as well as personal thoughts and measures that he thinks should be taken to avoid the situation.

“We don't want people to overreact [with fear], but knowledge is power, and they need to be aware of what's going on and what can be done.”

Wrensolutions.com

Bret Rachlin, director of marketing for Wren Solutions, (a provider of network video systems) says Wren's network video in education blog (wrensolutions.com/NetworkVideoEducationBlog/tabid/532/Default.aspx) was launched as a way to establish the company in the education market while providing a forum for school safety and security issues and to include network video. “We did research and didn't find anywhere that school administrators could collaborate about school safety and security issues,” Rachlin says. “There was a lack of cohesive information out there.”

Wren's blog gives commentary on school security issues. “We thought, instead of preaching, we should comment on articles that we post and ask questions about how the event was handled. What did the school have for security or funding?” he asks. “We want to foster dialogue so that schools and the people that run them investigate what their schools would have done if they were put in that situation.”

SafePlans' School Safety News Blog also features a School Safety Incidents Map that pinpoints security situations at schools from pre-K to college. Map icons indicate incidents involving intruders, need for lockdown, school shootings, IED or bomb threats, fire evacuation, damage to schools from weather or bus accidents.

Hackettsecurity.blogspot.com

Another blog with a rising readership is the Hackett Security Blog from Hackett Security (hackettsecurity.blogspot.com). Instead of writing informational entries, the blog simply posts pre-written articles that cover major movements and specific events from the industry. Chris Maples with Hackett Security says they try to post entries before the curve. “It's not so much about our opinion. We focus on what's going on around us, and we disperse news for informational purposes,” Maples says.

Roughly 30-40 percent of posts on hackettsecurity.blogspot.com are school-oriented, according to Maples, because it is such a hot topic. “Schools are a symbol of our future. Readers, especially parents, want to know these things.”

Not crossing a line

There are lines that school security blogs will not cross. For example, Spicer says SafePlan blog entries will not include ongoing issues that might expose a specific school to a risk as an operational security concern and to not put anyone in danger. “For example, if school ‘X’ in ‘Y’ city doesn't lock its doors, we would talk about the importance of locking doors, but we wouldn't expose the school directly,” Spicer says.

Rachlin says although they will cover all school safety topics, they are still sensitive to being critical of how a school handled a certain situation. “I won't do that since I don't know all the facts. But I will raise questions to talk about areas of where it's possible they didn't look into a certain solution,” he says.

“Educational security constantly needs tweaking because with each new school year there's a whole new group of students,” Rachlin says. “Having a blog in which someone writes about insight is another opportunity for people to think about what they are doing to avoid situations other schools face. If our blog does its job, school administrators will read it and think about what they are doing for their school.” ■

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Reader's Service Number 112

Does your institution embrace Green Cleaning?

Here's your chance to be recognized. AS&U's Green Cleaning Award for Schools & Universities recognizes and honors education institutions and their partners that embrace green principles and practices in their maintenance operations. Created in conjunction with the Green Cleaning Network and Healthy Schools Campaign, individual schools, school districts, colleges and universities are invited to submit information about their green cleaning program for review by an expert panel. Awards will be presented to exemplary programs and winners will be profiled in a special supplement in the December issue of *American School & University*.

For more information on how to enter, visit:
http://asumag.com/green_cleaning_award/
To view last year's winners, visit ASUmag.com/green.

GREEN CLEANING AWARD
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Green Cleaning

Today, green is all around us. Over the years, it has become clear that green cleaning is one of the lowest-hanging fruits. Many upgrades and improvements such as energy efficiency and water conservation are important and have a reasonable payback, but they can require significant upfront capital expenditures—capital that schools and universities often lack.

However, because schools and universities already have an established cleaning budget, the upfront expenditures are minimal at best. As the cost of green products—chemicals, paper, equipment, mats, tools—becomes comparable to its traditional counterparts, the barrier to adoption has gone away.

The benefits of green cleaning are real. It helps to reduce the environmental impacts associated with the billions of pounds of chemicals, paper and other items used annually by the cleaning industry. An effective green cleaning program can improve occupant health, performance and productivity. And it can help a facilities department demonstrate and promote its contribution to sustainability and solving global environmental problems.

The "Green Cleaning Award for Schools & Universities," sponsored by *AS&U* Magazine in partnership with the Green Cleaning Network and the Healthy Schools Campaign, has been developed to recognize the best-of-the-best and to promote "lessons learned" to help others get started or further improve their programs.

The award has been built around the *Quick & Easy Guide to Green Cleaning in Schools,* developed by the Healthy Schools Campaign (www.HealthySchoolsCampaign.org). Using this free guide, which identifies best practices in green cleaning products, processes, training, communications and more, makes the application process a good way to benchmark current cleaning practices, identify opportunities for improvement, and plan a path forward regardless of how new or advanced the cleaning program.

The awards application itself has been simplified. It asks for data about the institution, a written summary of the program, and a list of what green products and supplies are used. In addition, this year's application provides an easy-to-use outline of products, including chemicals, equipment, supplies, janitorial paper and plastic liners, that only requires the blanks to be filled in.

Winners will be recognized in *AS&U*'s December issue and will receive a certificate for members of the team, including staff, vendors and others who deserve to be recognized.

Perhaps as important, schools and universities can use the application process itself as a good way to review their existing programs annually.

Green cleaning has become a major part of the cleaning industry. Manufacturers in all product categories are investing heavily in "greening" their products. The innovations truly are remarkable.

Some green developments: chemicals made from bio-based ingredients; floor scrubbers and carpet extractors that eliminate chemicals and clean with only electrolyzed water; buffing pads for powered equipment that eliminate floor-stripping chemicals, and others that eliminate coatings and impregnators from terrazzo and marble floors; improved paper quality that reduces consumption; vapor, steam and hands-free cleaning equipment that reduce water consumption; and electric hand dryers that capture water droplets.

The real value of the application process might be to serve as an annual check-up or self-diagnosis of the state of the cleaning program and to aid in the process of continual improvement. And the lessons learned will help others as well.

Applications are due September 12 and can be found online at asumag.com/green_cleaning_award. ■

—*Stephen Ashkin, president, The Ashkin Group, LLC*

GREEN CLEANING AWARD FOR SCHOOLS & UNIVERSITIES
GRAND AWARD
COLLEGES
>> DELTA COLLEGE, UNIVERSITY CENTER, MICH.

PROGRAM INFORMATION
Number of students: 6,648
Square footage maintained: 1,042,243 sq. ft.
Number of full-time custodians: 29.5 FTE
Annual cleaning budget: $1,130,232 (total); $1,071,276 (salary and fringes), $58,956 (custodial supplies)
Green cleaning team members: Jeff Jump, Assistant Director of Facilities Management; Michelle Brandsterter, Robert Dzurka, Head Custodians; Arnold Sales, Central Michigan Paper, Eco-Lab, Gordon Food Service, Lansing Sanitary Supply, Supply Pro, Janitorial Product Distributors

Delta College began its recycling program in 1991. In 2001, walk-off mats were installed at every entrance, reducing labor by retaining debris within 15 feet of the entrance. Campus buildings have been smoke-free since 1998. In 2003, the university restricted the use of surface adhesives. "Green" magnets and paper grips were made available for posting signage, which reduced the cost of cleaning walls, doors and windows.

The college recently launched EverGreen, an environmental sustainability program. It also established an Environmental Sustainability Task Force to advise the college president on sustainability matters. The task force works to integrate sustainability into campus programs in education, operations and community service, and hopes to instill a culture of sustainability in long-range planning and forward-thinking design.

Each custodial staff member is provided an on-the-job custodial handbook that includes information about green-cleaning products and procedures. Hands-on training is required.

The college's green-cleaning procedures include reducing office waste collection from daily to weekly, changing liner bags only when soiled, and vacuuming private offices weekly instead of daily. Floor stripping has changed to top scrub, and recoating requires removal of the top layer only.

Used cleaning equipment is replaced with eco-friendly equipment. As inventory is depleted, traditional cleaning products are replaced with green products. Aerosol products have been reduced significantly.

Microfiber cleaning cloths and flat mops can be laundered and reused, reducing waste. Barley straw is used instead of chemical chlorines to prevent algaecide in the courtyard pond.

The college has amassed 1,000 tons of collected recyclable materials and $200,000 in savings. ■

GREEN CLEANING AWARD for Schools & Universities

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facilities upgrade & retrofit

A truly magnificent athletic field should be aesthetically pleasing and complement its surroundings.

Field Notes

Tips for administrators looking to upgrade or construct athletic facilities.

By Edward G. Parrone and Michael P. Montalto

The importance of athletic fields has increased in today's society because of the popularity of sporting events. As a result, education administrators face challenges when dealing with their athletic facilities. Decisionmakers constantly are being second-guessed in regard to outdated, overused facilities and lack of budget. Some of the questions being asked by administrators:

•"How do we make the right decisions about our athletic facilities?"

•"How will stakeholders react to athletic improvements?"

•"How can we pay for the project?"

•"How will improvements affect the safety of the student athletes?"

•"What would be the expected

life-cycle costs of improvements (installation, maintenance, repairs, etc.)?"

•"Who are the appropriate experts to help us make these decisions?"

Embarking on a new or upgraded athletic complex can be daunting. It is important to select a professional that understands the process, issues and considerations that must be addressed; analyzes needs and provides tools to help schools make informed decisions; and has site design and athletic field experience.

On the field

Key issues that should be considered when initiating an athletic facility project:

•Evaluating and recommending the solution that best meets athletic program needs (e.g. natural turf vs. synthetic turf).

•Evaluating the proper placement, based on facilities and the master plan. Representatives from the campus, neighborhood and other stakeholders should be involved.

•Blending the project site into the surroundings through landscaping and site lighting in order to satisfy environmental concerns.

•Designing roadways, access ways, sidewalks and parking for vehicle and pedestrian circulation.

•Designing stormwater management to maintain fields, and addressing stormwater quality and quantity for the runoff associated with fields.

•Evaluating the proper placement of the field based on potential environmental impacts, soil investigations, access and future planning.

Each of these issues complements the others and contributes to the success of a project. For example, the design of roadways and sidewalks must be planned before landscaping decisions can be made.

In addition, the following important components for athletic field projects should be considered:

•Safety for players, spectators and officials.

•Adequate, safe and convenient parking.

•Proper surface and sub-surface drainage.

•Safe and efficient lighting for the desired purpose (e.g., practices, night games and televised games).

•Impacts to the neighborhood (e.g. aesthetics, noise and traffic).

•Access for emergency vehicles.

•Easily maintained facilities.

•Unobstructed, safe viewing lines for spectators.

•Fencing and walkway systems that guide pedestrians and enable quick exits during emergencies.

•Clear, audible sound systems and visible scoreboards.

•College and high school sporting standards (e.g., NCAA, NTSFB, NFHS, IAAF).

A truly magnificent athletic field should be safe and functional; it should be aesthetically pleasing and complement its surroundings.

The successful approach

Here are six steps that can help administrators achieve a winning design for their athletic fields:

1. Selecting an engineer. Prior to determining solutions for its athletic needs, a school should seek assistance from a qualified, impartial professional. Just as a team's success depends on selecting the right player for a particular role, a project's success depends on selecting the most appropriate professional to lead a design team. All too often, administrators try to get a head start by searching out companies that can provide a variety of products for their athletic needs. However, the overall process should begin by completing a needs analysis in order to provide a proper design.

2. Identifying stakeholders. The second phase consists of identifying and engaging stakeholders. For education institutions, this group should include business administrators, athletic directors, coaches, athletes and community members. It is imperative that this group be diverse enough to represent the different perspectives of the project, yet small enough to make decisions quickly. A group of 10 to 15 people is likely to meet this goal effectively. Bringing these individuals into the process as early as possible helps ensure a clear communication and decision-making path. After the stakeholders are identified, representatives are brought together through focus-group meetings.

3. Establishing goals and objectives. Focus-group meetings enable stakeholders to establish common goals and objectives by developing a project mission statement. During this step, the group establishes a project timeline and a tentative schedule; it will be monitored closely by the design professional in order to make any necessary adjustments. Through regular meetings, the focus group delineates needs vs. wants by referring back to the project mission statement. Focus-group meetings also are the appropriate forum to address issues and concerns about the project. A collaborative solution can be reached through honest and open discussion in a supportive and respectful environment.

4. Value-added recommendations. The most critical task in the process is making value-added recommendations, which are written descriptions of the program that include ideas about how to improve the project or reduce its costs. These recommendations should always align with the project mission statement. The ability to provide value-added rec-

Lighting is an important consideration when planning athletic fields.

ommendations is derived from being knowledgeable about technological advances; construction practices; testing; needs of players, trainers, coaches and facility operators; expectations; and prior experiences with playing surfaces. Informal interviews with interested parties, along with on-site reviews of existing facilities, also can be valuable tools in the process of developing value-added recommendations.

5. Design. The design phase takes the approved recommendations and develops a plan that addresses needs, expectations and a budget. In addition, a tight performance specification is developed. The final design incorporates all recommendations and written programs developed by the focus group.

6. Implementation. The implementation, or construction, phase is necessary in order to ensure that the selected contractor possesses the experience and technical capability to complete the project. A significant component of this phase typically is the bidding process. The key to a competitive bid is to use a performance specification to ensure the desired results. Prequalification of system manufacturers and general contractors must be part of the bidding process; this affords a win-win situation for the parties involved. ■

NOTABLE

360 Total length (in feet) of an NCAA football field.

200 to 225 Total distance (in feet) at center field for an NCAA softball field.

Source: NCAA.org

Parrone, PE, is president and CEO of Parrone Engineering, an East Rochester, N.Y.-based engineering firm that has completed several athletic field-related projects for education institutions. Montalto is project manager with the firm. Visit the website at djparrone.com.

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Washrooms

Schools and universities that have not upgraded their washrooms in many years should be able to reap savings by installing systems that use water and energy more efficiently.

No matter what the size of the education institution, the subjects being taught or the age of the students being served, washrooms are a universal presence in schools. Making sure they are well-maintained is a top priority; the green movement in education design and construction has empowered many facility managers to upgrade their washrooms so they are not only clean, but also environmentally friendly.

Energy guidelines put together by the North Carolina Department of Public Instruction recommend several ways to reduce the amount of water consumed in school washrooms:

•**Rainwater collection.** Water is collected from roofs or ground-level surfaces and stored in a tank. The water is filtered and can be used for showers, sinks, laundries and toilet flushing.

•**Grey-water systems.** Untreated, used water that has not been contaminated by toilet waste (e.g., water from showers, bathroom wash basins and washing machines) can be filtered, sterilized, deodorized and recycled for flushing toilets and urinals.

•**Waterless urinals.** Many schools and universities have opted to install urinals that require no water.

Advocates of health and hygiene routinely emphasize that washroom users should clean their hands before exiting. That requires soap and water, but schools can install systems that dispense water more efficiently. That means faucets that encourage students and staff to use less water. Low-flow faucets, showerheads, toilets and urinals are available that use less water than older models. Faucets or showerheads that turn off automatically or use sensors or timers to control operation prevent water from running unnecessarily.

Timers and occupancy sensors also can be used in school washrooms to provide lighting only during school hours or when someone enters the space.

After a school or university has explored all the ways to conserve water in its washrooms, one more environmental question remains: How should users dry their hands after washing them?

So which method is more energy-efficient—paper towels or electric hand dryers? It depends. The variables include how many towels a person uses, the type of paper towels used, the wattage of the electric dryer, and how long the electric dryer operates.

Paper towels don't consume electricity, but producing them consumes many trees, and manufacturing and transporting them consumes energy. Manufacturing and disposing of the garbage bags that collect used paper towels also consumes energy. Electric hand dryers consume electricity when they are being used, but once they are manufactured, they do not consume any materials or contribute to the waste stream.

The Climate Conservancy, a non-profit group that seeks to reduce greenhouse gas emissions, has crunched some of the numbers and concluded that in general, using the typical electric dryer found in a public washroom is better for the environment.

"If you walk into an average bathroom and use an average hand dryer in an average way, you'll be causing somewhere between 9 to 40 grams of carbon dioxide emissions," the conservancy says. "If you use two towels, data suggests you will be responsible for roughly 56 grams of carbon dioxide emissions. So, if you're not willing to use your pant leg, your best bet is an efficient dryer and, if one is not available, go for one towel."

Although the conservancy's calculations used what it considered an "average" electric dryer, it noted that newer dryers are being manufactured that supposedly operate more efficiently and dry more effectively. "These redesigned dryers may be a great way to conserve energy," the conservancy says. ■—*Mike Kennedy*

facilities upgrade & retrofit

School buildings that have a history of water leaks present a higher degree of mold risk.

Breathing In

Recognizing and controlling mold are key to good indoor air quality in education institutions.

By Daniel P. Mahoney

Healthful indoor air quality in education facilities can improve the learning environment for students, enhance teacher job satisfaction, and reduce staff complaints. A proactive indoor air quality program helps identify and eliminate conditions that could lead to IAQ complaints, building-related illnesses and workers' compensation claims.

Water intrusion and the mold growth that often results can present significant cleanup and remediation costs, and those may not be covered by some insurance policies.

Water and mold factors

Schools typically have large buildings and large roof areas. As a school's roof ages, the probabil-

ity of leaks associated with storms increases. Also, plumbing leaks or sewer backups that allow water into a school often lead to a mold and bacteria problem. Water intrusion that occurs during school construction and renovations also is associated with uncontrolled mold growth.

The key to control is preventive maintenance of building systems, as well as regular inspections to identify leaks. Thorough planning prior to construction is critical to avoid moisture from entering the structure. Contractors should be required to protect construction materials from precipitation once they have been delivered to a site. Additionally, building openings should be protected when possible to reduce the amount of moisture that enters the interior of the structure during construction.

Weather influences the degree of mold risk. School buildings situated in areas with high precipitation or persistent high humidity must defend against the outdoor conditions. In order to control indoor mold growth, the humidity should be kept below 60 percent relative humidity. Properties situated within flood-plain areas also may need special design considerations, such as sump pumps, moisture barriers and exterior grading, to prevent rising surface and ground water from entering the structure. Basements and crawl spaces that are persistently high in humidity can be sources of mold that can damage stored contents and building structure integrity.

Interior moisture sources from school activities such as indoor pools and locker rooms also can contribute to the humidity levels within the structure. The heating, ventilation and air-conditioning (HVAC) systems in these spaces need to be designed to handle the excess moisture load.

School buildings that have a history of water leaks present a higher degree of mold risk. Persistent small leaks that are not resolved, such as small roof leaks or leaks around window frames, commonly are associated with uncontrolled mold growth. More extensive leaks that take longer than two days to clean up and to dehumidify the area also are high risk indicators. If porous or semi-porous materials such as school books, carpeting, art projects and in-

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dustrial wood-shop dust have gotten wet and remain within the building, these materials are likely to harbor mold growth.

Clean it up

Preventive maintenance of HVAC, plumbing and other building systems can reduce the potential for mold growth. Buildings and maintenance staff that disregard HVAC maintenance of basic components such as filter changes and condensate drains are at increased risk. HVAC systems that cycle off during non-occupancy hours to save energy can result in fluctuations in temperature and humidity conditions, which may promote mold growth. Undersized and oversized HVAC systems also are associated with inadequate moisture control.

The EPA document "Mold Remediation in Schools and Commercial Buildings" provides guidance on cleanup methods, personal protective equipment (PPE) and type of containment suggested. Also, the New York City Department of Health has published *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*. The guidelines help to define the potential degree of risk and provide suggested cleanup methods based on the extent of damage and the building materials involved. These guidelines outline general abatement strategies based on the square footage of moldy area. The levels are defined as follows:

•Level I: Small Isolated Areas (10 sq. ft. or less), such as ceiling tiles and small areas on walls.

•Level II: Mid-Sized Isolated Areas (10 to 30 sq. ft.), such as individual wallboard panels.

•Level III: Large Isolated Areas (30 to 100 sq. ft.), such as several wallboard panels.

•Level IV: Extensive Contamination (greater than 100 contiguous square feet in an area).

•Level V: Remediation of HVAC Systems.

If mold growth has been a problem in the past, or if remediation has occurred, the cleanup methods used can be an indication of the probability of a reoccurrence. If cleanup was slow to occur (more than two days) after the leak, and if it was limited to air drying and vacuuming up water, that could be a sign that the cleanup was inadequate.

Cleanup should include:

•Discarding water-damaged porous and semi-porous materials.

•HEPA vacuuming.

•Containment of work areas.

•Dehumidification.

•Clearance inspections and sampling.

The New York City Department of Health Guidelines, citing ASHRAE 55-1992, suggest that:

"In all situations, the underlying cause of water accumulation must be rectified or fungal growth will recur. Any initial water infiltration should be stopped and cleaned immediately. An immediate response (within 24 to 48 hours) and thorough cleanup, drying, and/or removal of water-damaged materials will prevent or limit mold growth. If the source of water is elevated humidity, relative humidity should be maintained at levels below 60 percent to inhibit mold growth. Emphasis should be on ensuring proper repairs of the building infrastructure, so that water damage and moisture buildup do not recur." (Section 3, Remediation, *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*, New York City Department of Health)

Evaluating risk

If a school has indoor air quality complaints, it may be necessary to consult a certified industrial hygienist experienced with resolving indoor air quality issues in schools. An industrial hygienist can:

•Sample for mold, bacteria, volatile organics, dust, carbon dioxide and comfort parameters.

•Evaluate ventilation systems and compare the results with ASHRAE standards.

•Evaluate and develop a school's IAQ program.

•Explain air-sampling results and observations to school administrators, teachers and parents.

•Develop, in conjunction with the buildings and grounds staff, proactive indoor-air-quality programs.

Acceptable indoor air quality requires the control of airborne contaminants, the introduction of fresh outdoor air, regulation of temperature and humidity, and proper design and maintenance of HVAC systems. Uncontrolled growth of mold and bacteria indoors can expose students and school staff to unhealthful conditions, result in property damage, and impair the use of school buildings.

Because mold and bacteria are present naturally in indoor environments, the recognition of those factors that promote their growth indoors is critical to control their amplification. The key to biological contaminant control is to prevent water from entering school buildings and to control the relative humidity inside. ■

NOTABLE

24 to 48

Response time (in hours) necessary to help prevent mold growth after water infiltration occurs.

Mahoney, CIH, CSP, is vice president of risk control for Professional Underwriters, Exton, Pa., which provides risk-management services and insurance products to schools, municipalities and public authorities. He can be reached at dmahoney@ProfessionalUnderwriters.com.

Energy

Bucholz High School, Gainesville, Fla.

The ability to independently control humidity and temperature levels in education institutions is becoming increasingly important. Typical HVAC equipment with temperature-only control can overcool a space in an attempt to reduce humidity. Maintaining relative humidity (RH) levels below 65 percent per ASHRAE's recommendation helps improve indoor air quality that can positively affect the health and productivity of occupants.

Some factors to consider when selecting either rooftop or split systems for optimum temperature and humidity control:

•**Stage compressor(s) to match cooling capacity to cooling load requirements.** Equipment with staging capability, to better match capacity and load requirements, will be less likely to overcool the space in an attempt to meet reduced RH levels. For single-compressor systems, look for two-stage compressors. For multi-compressor systems, look for the HVAC controls to stage compressors on and off as the load changes.

•**Select HVAC equipment with OEM-designed and integrated dehumidification systems.** HVAC equipment can be integrated with dehumidification systems, such as hot gas or liquid reheat. Generally, the air is cooled first, pulling out humidity. Then the reheat coil, placed downstream from the evaporator, uses either the hot gas from the compressor or hot liquid from the condenser coil to heat up the cooled and dehumidified air to prevent overcooling. Third-party add-on dehumidification systems can be complicated to install, and difficult to control and troubleshoot.

•**Choose the appropriate sensible-to-latent ratio for dehumidification.** The sensible-to-latent ratio (S/T ratio) determines the ratio of capacity available for cooling and dehumidification. The lower the S/T ratio, the greater capacity for dehumidification. Look for HVAC systems that can vary the S/T ratio, depending on the cooling and humidity loads, to optimize comfort. Look for engineering data from the OEM to match equipment and space S/T ratios appropriately.

•**Choose simple controls for integrated dehumidification systems.** Selecting HVAC systems with integrated controls for independent temperature and humidity controls simplifies installation and troubleshooting. Integrated controls also provide a lower total cost of ownership, with a lower installation cost and fewer parts to repair and maintain.

For rooftop units, systems are available that use a humidistat to sense RH levels, and an intelligent DDC to control the staging of compressors in reheat and cooling modes, varying the S/T ratio to match space conditions. For split systems, a field accessory can be mounted downstream of the air handler or furnace, requiring only a thermostat to sense and control RH levels, with no additional control boards or sensors. ■—*Jeff Hartnett, Product Manager, Lennox Industries Inc.*

NOTABLE

$1.52 The median amount schools spend per square foot on total energy and utilities.

$1.87 The median amount colleges spend per square foot on total energy and utilities.

Source: American School & University's *M&O Cost Studies, April 2008*

Consistent signage containing a logo or brand creates name reinforcement and a cohesive connection between the environment and the institution.

Signs of the Times

Tips for creating signage that displays layers of assistance that visitors are unaware they are using.

By Ernest Dwight

Campus signage provides important navigational information, and it reflects an institution's image. Creating a signage system using strategically planned design methodology, precision fabrication, plus well-planned placement, enhances a campus environment. This helps create a positive experience for visitors and prospective students.

An effective and cohesive signage system heightens the excitement of a vibrant and creative institution; on the other hand, a proliferation of wordy signs in unmatched shapes, colors, materials and typefaces creates visual clutter and confusion. First-time visitors, unfamiliar with a campus layout, rely heavily on signage to find their way around, and depend on the institution to make signs understandable and visually appealing.

Through signage, also known as environmental graphics, a school can reinforce its brand identity and image. Often, signage is a visitor's first impression or strengthens preconceived notions. Consistent signage containing a logo or brand creates name reinforcement and a

cohesive connection between the environment and the institution. Signage offers a unique opportunity to create value and promote school attributes through its branding.

Developing a program

Navigating a campus involves a series of sign types, each serving a unique function. Designing and planning this integrated system of signs is known as wayfinding. To be effective, wayfinding should have easily accessible information and direction that is provided in a clear visual format.

Professional sign planners can identify sign types systematically and then develop a hierarchy within each type. They list all of the facilities that need identification and then evaluate the need for the various types of signs. Unique sign types:

•**Identification signs** name a facility or location. They help visitors and members of the campus community find buildings and facilities, and provide addresses for emergency personnel. Identification signs range from massive entry monuments at campus boundaries, to identification of buildings, to objects as small as restroom door signs.

•**Directional signs** guide people to a facility or location. Using combinations of words, arrows and sometimes symbols, they guide people to their destinations.

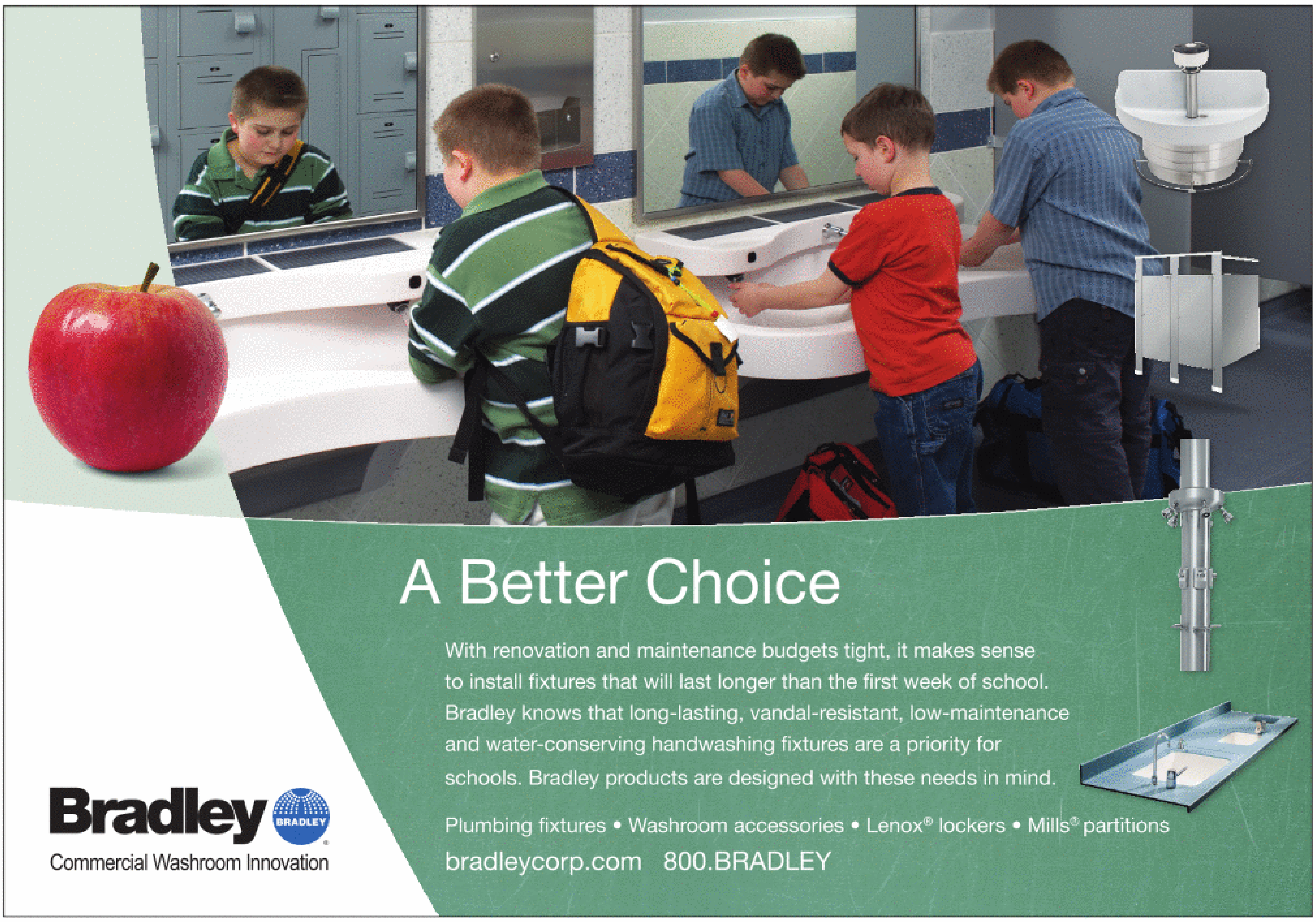
•**Informational signs** provide necessary facts such as hours of operation, areas with Wi-Fi accessibility, and event and lecture schedules. They also can make note of the benefactor, architect and construction date of significant architectural structures.

•**Regulatory signs** establish what is and is not permitted. These "behav-

NOTABLE

Unique types of signs:

- •Identification signs
- •Directional signs
- •Informational signs
- •Regulatory signs



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ior-influencing" signs might include stop signs, pool rules signs and signs prohibiting skateboarding.

Functional by design

A cohesive design plan unifies the various sign types in a campuswide sign system. To get the maximum benefit (and efficiency) from campus signage, an institution has to produce

Visitors should never have to look for a sign; it should be there when they need it.

a program that emulates the ideals they want to promote. The campus seal, the architectural design of the signs, and the potential use of school colors and logos all have a strong influence on the perception of the school. Designers can incorporate these elements into the master plan for signs.

Sign location affects design as well. Viewing and site conditions affect each sign's design. Local codes, zoning regulations and restrictions can play a critical part in the size,

A campus map can be beneficial to first-time visitors.

style and location of campus signage, particularly on large campuses.

Finally, design consistency makes an effective campus signage program attractive. To maintain consistency, designers strive for image repetition, and use established size criteria and visual contrast for message legibility. They compare each sign type with others in the program to ensure an integrated look. This thoughtfulness to design has the added benefit of helping a school incorporate future signage.

Mapping the way

A good signage program is more than well-designed signs containing accessible and relevant information positioned at appropriate decision points. It is visual language that creates an accessible, transparent information system.

Successful programs incorporate effective wayfinding that targets new visitors. Members of the campus community familiar with the surroundings do not need signage to guide them or tell them where they are, but new visitors want to know quickly where to go. Inappropriate sign design and placement cause confusion in unfamiliar environments. Signs lacking visibility and legibility from poor copy or color choices, inaccurate or unclear information, or signs obscured by trees or other obstructions all detract from a successful sign program.

Having too many signs can be just as detrimental as having too few. Even visually appealing, consistent, relevant signage overwhelms an environment when there are too many signs. Create a user-friendly program by providing

Directional signs use a combination of words and arrows to guide people.

campuswide points of reference that identify current location and potential destination. Once a visitor arrives at a given destination, give detailed information about that specific area to minimize information overload.

In keeping with the "keep it simple" principle, minimizing sign copy helps convey meaning, adds to visual acuity, and creates a more graphically pleasing sign. Simplicity of the sign copy is as important as minimizing the number of signs.

A superior signage system uses key words and consistent design elements to create layers of assistance that visitors are unaware they are using. Successfully achieving this requires finding the best design solution combined with the right size, placement and location for every sign. Visitors should never have to look for a sign; it should be there when they need it. Signage should be easy to read. It should tell visitors exactly what they need to know, and it should lead them effortlessly to their destinations.

Although it isn't necessary to master the technicalities of signage, it is important to understand the important role signage can play and the positive impact it can have on a campus. ■

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